1999

Graduate Program in Computer and Information Sciences Program

Nova Southeastern University

NOVA SOUTHEASTERN UNIVERSITY

Graduate Catalog

The School of Computer and Information Sciences

1999 – 2000

Nova Southeastern University

The School of Computer and Information Sciences

1999 – 2000 Graduate Catalog

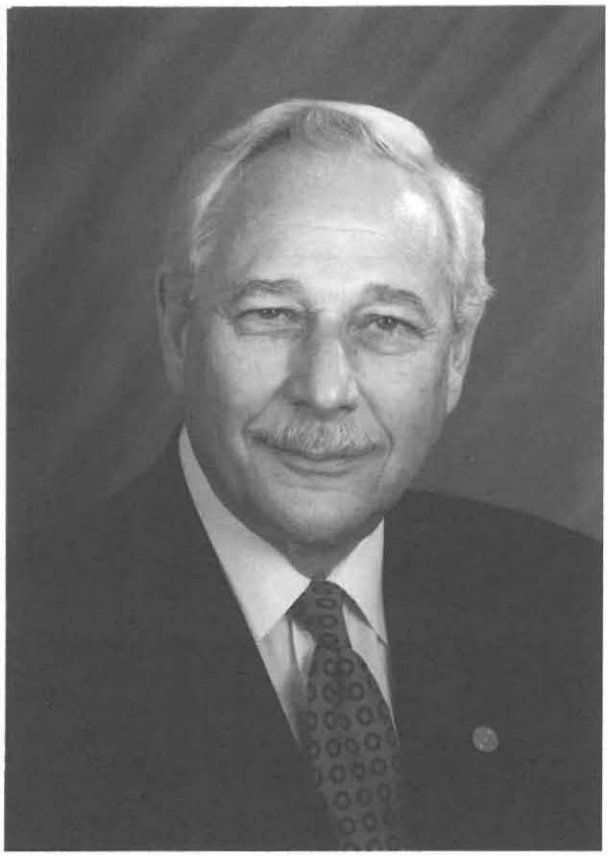
Published February 1999

This catalog describes the degrees and programs offered by The School of Computer and Information Sciences (SCIS). Policies and programs in the catalog are effective through December 31, 2000. Policies, regulations and requirements, including fees, are subject to change without notice at any time at the discretion of the Nova Southeastern University (NSU) administration. The university reserves the right for any reason to cancel or modify any course or program listed herein. In addition, individual course offerings may vary from year to year as circumstances dictate.

The university recognizes that individual degree programs require different time limits for the completion of academic studies. Therefore, the time frame is a matter within the discretion of each academic program.

Nova Southeastern University admits students of any race, color, sex, age, nondisqualifying disability, religion or creed, or national, or ethnic origin to all rights, privileges, programs, and activities generally accorded or made available to students at the school, and does not discriminate in administration of its educational policies, admissions policies, scholarship and loan programs, and athletic and other school-administered programs. Nova Southeastern University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097: Telephone number 404-679-4501) to award bachelor's, master's, educational specialist, and doctoral degrees.

President's Message



As we approach the end of the decade and plan for the dawn of a new century, Nova Southeastern University enjoys a reputation for providing a wide spectrum of higher education opportunities to diverse populations at times and in locations convenient for the student. I am proud to begin my tenure as President following twenty years of association with the university through service on the Board of Trustees, including service as Board Chair from 1988 to 1995.

During those years as a University Trustee and Chair, I witnessed a period of extraordinary growth and development for the university. The administration, Trustees, faculty and staff worked together to meet the challenges of expanding the university's vision and mission while maintaining the excellence of our existing programs. All of us experienced the satisfaction of graduates moving into leadership roles in their respective professions, as well as the appreciation of recipients of community services offered through university programs. To date, the university has graduated 55,000 students-an accomplishment which reflects the overall success of the efforts of every individual who has been part of the university community.

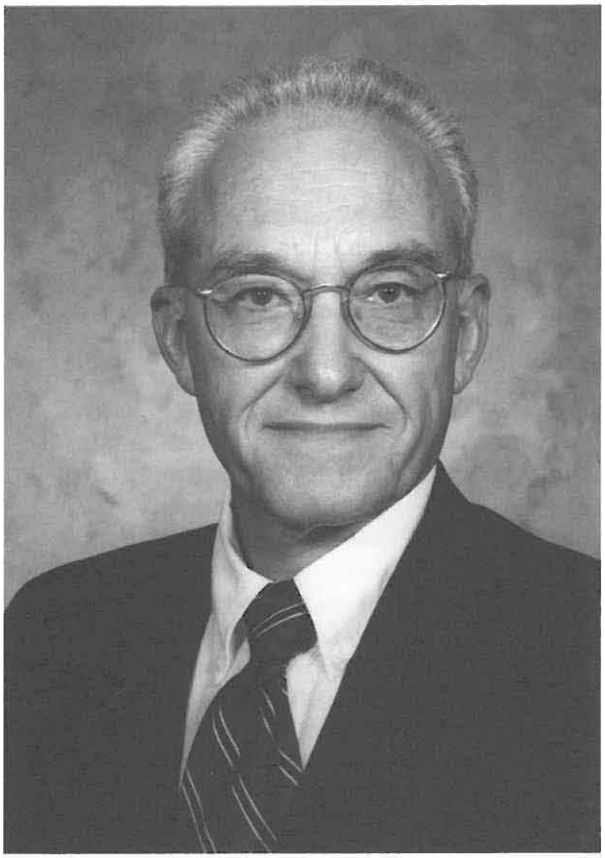
Since 1972, the university has provided higher education to traditionally underserved groups by taking the instructor to the student, an innovation that radically changed the higher education landscape. Our adult learners have enjoyed the ability to maintain their employment while pursuing advanced degrees relevant to their professional fields of interest. Nearly one-third of the university's 16,500 students take classes outside the South Florida area, with clusters of students receiving instruction in twenty-two states and six foreign countries.

While enjoying a reputation for providing a student-friendly model of distance education course work, the university offers a unique blend of off-campus courses, online programs, and more traditional access through campus-based programs in the area of Fort Lauderdale, Florida. The university offers a total of 84 degree programs, 23 in undergraduate disciplines and 61 in graduate disciplines. University facilities now comprise 1.9 million square feet of classroom and office space, primarily at the 232-acre Davie Campus. Additional facilities are located in Coral Springs, Fort Lauderdale and North Miami Beach. Two-thirds of all students enrolled at Nova Southeastern University attend classes in the three counties (Broward, Miami-Dade and Palm Beach) immediately surrounding the university.

In 1995, Nova Southeastern University became the largest private institution of higher education in the State of Florida based on Fall Term headcount enrollment. Predictions for the university's future include continuing increases in annual enrollment as the university experiences the addition of the College of Dental Medicine opened in Fall 1997, and planning moves forward for other new initiatives. While the university will continue to support the development of new programs that appropriately complement existing curricular offerings, we must place renewed emphasis on enhancing the overall quality of university programs. Through prudent fiscal management of both off-campus and on-campus resources, our vision for the future must focus on continuous improvement in student learning, ever broadening access for the working adult, expanding partnerships with the local community, and enhanced cooperation with other institutions of higher education, especially those within the State of Florida.

Ray Ferrero, Jr.
President
Nova Southeastern University

Dean's Message



In this era of rapid technological growth, each new day brings demands for increased proficiencies of those whose professions intimately involve computers, e.g., creation of computer/software products or information systems, teaching computing, using computing technology in education and training, managing computing resources, or conducting research. A challenge for the School of Computer and Information Sciences is to offer programs that are timely yet provide an enduring foundation for future professional growth. Another challenge is to enable the working professional to earn a graduate degree without interrupting his or her career and without moving away from home.

To meet these challenges, the school offers on-campus master's programs in the evening, online master's programs, and combined on-campus and online doctoral programs.

The online format for our master's degree programs requires the completion of 12 online courses or 10 online courses plus a thesis. Online courses require use of a computer (IBM-compatible PC or Apple Macintosh) and a modem from home, office, or on the road while traveling. Students participate in courses via the Internet from anywhere in the United States or outside the United States. Interactive learning methods involve World Wide Web pages to access course materials, announcements, the electronic library, and other information, plus a range of online activities that facilitate frequent student–faculty and student–student interaction. Online activities may include forums using threaded bulletin boards, chatrooms, email, and electronic classroom sessions. In addition, the school provides a system that enables the student to submit assignments online in multimedia formats and to receive his or her professor's online reviews of assignments in the same multimedia formats.

The combined on-campus and online doctoral programs includes two formats: *cluster*, and *institute*. Both include a blend of on-campus and online activities. Students choosing the cluster format attend four cluster meetings per year, held quarterly over an extended weekend at the university. Students choosing the institute format attend a week-long institute twice a year at the university. Clusters and institutes bring together students and faculty for participation in courses, dissertation counseling (individual and group), a variety of lectures and workshops, and student–faculty interaction.

To hone skills and develop confidence and independence, our programs — both on-campus and online — place greater-than-usual emphasis on projects. In many cases, a subject course is supplemented by a project course of equal or greater academic credit.

Edward Lieblein, Ph.D.
Dean
School of Computer and Information Sciences

Contents

Nova Southeastern University

Nova Southeastern University (NSU) is a dynamic, not-for-profit independent institution dedicated to providing high quality educational programs of distinction from pre-school through the professional and doctoral levels, as well as service to the community. NSU prepares students for lifelong learning and leadership roles in business and the professions. It offers academic programs at times convenient to students, employing innovative delivery systems and rich learning resources on campus and at distant sites. The university fosters inquiry, research, and creative professional activity, by uniting faculty and students in acquiring and applying knowledge in clinical, community, and professional settings.

Located on a beautiful 232-acre campus in Fort Lauderdale, NSU has approximately 16,500 students and is the largest independent institution of higher education in Florida. It ranks twenty-fifth in the size of its graduate programs among the 1,560 universities in the United States with graduate programs and tenth among private universities. NSU awards bachelor's, master's, educational specialist, doctoral, and first professional degrees in a wide range of fields. It has an undergraduate college and graduate schools of medicine, dentistry, pharmacy, allied health, optometry, law, computer and information sciences, psychology, education, business, oceanography, and social and systemic studies. The institution also enjoys an excellent reputation for its programs for families offered through the Family and School Center, including innovative parenting, preschool, primary, and secondary education programs.

The university's programs are administered through academic centers that offer courses at the Fort Lauderdale campuses, as well as at locations throughout Florida, across the nation, and at selected international sites in Europe, Canada, Israel, and the Caribbean. Despite the geographic diversity of sites where classes are offered, more than eighty-three percent of the student body attend classes in Florida.

NSU's library system is comprised of the East Campus Library, Einstein Library, Health Professions Division Library, Law Library, North Miami Beach Fischler Center for the Advancement of Education Media Union, Oceanographic Library, and four school libraries on the Davie Campus. The catalogs of all NSU libraries are accessible to local and distance education students and faculty, wherever they may be located, via computers using the Electronic Library. Overall, the university libraries house approximately 340,000 volumes and 1,200,000 microform units. Online and CD-ROM databases complement the paper-based holdings and provide full-text resources. In order to further assist distance education students with library requirements, contracts, when necessary, are signed with local university libraries to provide library services. Interlibrary loan arrangements through networked organizations such as the Online Computer Library Center (OCLC), the Southeastern Florida Information Network (SEFLIN), the Consortium of Southeastern Law Libraries (COSELL), and the National Library of Medicine provide broad access to a wide range of materials.

Nova Southeastern University has produced approximately 55,000 alumni. Since 1971, it has enjoyed full accreditation by the Commission on Colleges of the Southern Association of Colleges and Schools, the regional accrediting body for this region of the United States.

The success of NSU's programs is reflected in the accomplishments of its graduates among whom are:

a) Thirty-eight college presidents and chancellors

b) More than 100 college vice presidents, provosts, deans, and department chairs

c) Sixty-five school superintendents in 16 states, including nine of the nation's largest school districts

d) Hundreds of college and university faculty members nationwide

e) More than 100 high-ranking United States military officers, including admirals and generals, and business presidents, vice presidents, executives, middle managers, and researchers at companies such as American Express, Ameri-First Bank, AT&T, Bellcore, General Electric, GTE, Harris Corporation, IBM, Lenox China, Motorola, Nortel, Racal Datacom, BellSouth, Westinghouse, and William Penn Bank.

The School of Computer and Information Sciences

A major force in educational innovation, the School of Computer and Information Sciences (SCIS) chool provides educational programs of distinction to prepare students for leadership roles in computer science, information systems, information science, and computing technology in education. It is distinguished by its ability to offer on-campus, online (via the Internet and World Wide Web), and hybrid on-campus/online formats that enable professionals to pursue B.S., M.S., Ed.D., and Ph.D. degrees without career interruption.

Ranked by *Forbes* magazine as one of the nation's top 20 cyber-universities, SCIS pioneered online graduate education with its creation of the electronic classroom and has been offering online graduate programs and programs with an online component since 1983. The school, which has more than 1,100 students, has been awarding graduate degrees since 1980. The school's research advances knowledge, improves professional practice, and contributes to understanding in the computer and information sciences.

The school offers programs leading to the B.S. in computer science and computer information systems; the M.S. in computer science, computer information systems, management information systems, and computing technology in education; the Ph.D. in computer science, information systems, computer information systems, information science; and the Ph.D. or Ed.D. in computing technology in education.

The M.S., which is offered on campus or online, requires 36 credit hours and may be completed in 18 months. To earn the M.S. in 18 months, the student must enroll in two courses each term. Terms are 12 weeks long and there are four terms each year. Master's terms start in September, January, April, and July. SCIS master's students may be granted early admission into the doctoral program. Early admission provides the student the opportunity to earn the Ph.D. or Ed.D. in a shorter time.

Doctoral students may take one of two formats: *cluster* or *institute*. Clusters and institutes bring together students and faculty for participation in courses, seminars, and dissertation counseling. Between meetings, students work on assignments and projects, and participate in online activities that facilitate frequent interaction with the faculty as well as with other students. Cluster students attend four cluster sessions per year, held quarterly over an extended weekend at the university, during the first two years of their programs. Cluster terms start in March and September. Institute students attend weeklong sessions at the university twice a year at the start of each term. Institute terms start in January and July. Cluster and institute terms are five-months long.

Online activities require use of a computer, modem, and an Internet Service Provider. Online, interactive learning methods are used throughout the instructional sequence. Online courses require use of a computer (IBM-compatible PC or Apple Macintosh) and a modem from home, office, or on the road while traveling. Students participate in courses via the Internet from anywhere in the United States or outside the United States Interactive learning methods involve World Wide Web pages to access course materials, announcements, the electronic library, and other information, plus a range of online activities that facilitate frequent student–faculty and student–student interaction. Online activities may include forums using threaded bulletin boards, chatrooms, email, and electronic classroom sessions. In addition, the school provides a system that enables the student to submit assignments online in multimedia formats and to receive his or her professor's online reviews of assignments in the same multimedia formats.

Degrees and Programs of the School of Computer and Information Sciences

Bachelor of Science (B.S.)
- Computer Information Systems
- Computer Science

Master of Science (M.S.)
- Computer Information Systems
- Computer Science
- Computing Technology in Education
- Management Information Systems

Doctor of Philosophy (Ph.D.) or Doctor of Education (Ed.D.)
- Computer Information Systems (Ph.D.)
- Computer Science (Ph.D.)
- Computing Technology in Education (Ph.D. or Ed.D.)
- Information Science (Ph.D.)
- Information Systems (Ph.D.)

Graduate Certificate Program in Information Resources Management (IRM)

Florida Teacher Certification/Recertification Courses in Computer Science

Application for Admission

Applicants must satisfy the program-specific admission requirements described in the individual program sections of this catalog. To obtain information or application forms, contact:

The School of Computer and Information Sciences
Nova Southeastern University
P.O. Box 290600
Fort Lauderdale, FL 33329-0600

800-986-2247, ext. 2000 or (954) 262-2000
Email: scisinfo@scis.nova.edu
Web Site: www.scis.nova.edu

General Information on SCIS Graduate Programs

Admissions

The Admissions Process

Admission to the School of Computer and Information Sciences is competitive. The school qualitatively evaluates applicants and makes selections based on performance, personal qualifications, and evidence of potential for success. Admission requirements for master's degree programs are specified in the section General Information on Master's Degree Programs and in descriptions of individual master's programs. Admission requirements for doctoral degree programs are specified in the section General Information on Doctoral Degree Programs and in descriptions of individual doctoral programs. International students should follow the instructions contained in this section (see Admission of International Students).

Admission of Non-Degree Students

A qualified applicant wishing to take one or more graduate courses but not having an immediate degree objective is welcome to the extent that school resources allow. An applicant requesting non-degree status must meet the following academic requirements:

Those wishing to take courses at the master's level must have an earned bachelor's degree in a related field from a regionally accredited college or university and must submit a Non-Degree Application and official transcripts of all undergraduate and graduate education showing an undergraduate GPA of at least 2.5 and a GPA of 3.0 in a major field. Non-degree students wishing to take doctoral-level courses or projects must have an earned master's degree in a related field from a regionally accredited college or university and must submit a Non-Degree Application and official transcripts of all graduate education showing a graduate GPA of at least 3.25. An applicant may be required to submit a portfolio of relevant professional experience and credentials for evaluation.

Non-degree students may take up to 18 credits and must maintain a 3.0 GPA to continue enrollment in non-degree status. The non-degree student may apply for degree status at any time by completing the regular graduate admissions application process. Satisfactory completion of courses by non-degree students does not guarantee admission to a graduate degree program. Courses completed while the student is in a non-degree status will be evaluated by a faculty committee as to the suitability of their transfer into the desired graduate degree program. Courses applied to a graduate degree must fall within the time frame specified for the degree. An international student on a non-immigrant visa may not enroll in the non-degree status. Non-degree students are not eligible for financial aid.

Admission of International Students

The School of Computer and Information Sciences welcomes applications from international students. An *international student* is a student who is neither a citizen nor a permanent resident of the United States. Admission requirements for international students are as follows:

a) A completed application accompanied by an application fee in U.S. dollars. The application must be completed in English.

b) Official transcripts of all undergraduate and graduate academic work from institutions of university standing. Official documents must be certified by an officer of the institution attended and must show all post-high-school work attempted including grades in each course and standing in examinations and classes. Documents issued in a language other than English must be accompanied by a certified English translation from an NSU-approved agency. Translations made by applicants are not acceptable. In cases where the original academic records do not state that a degree has been awarded, certified copies of the original diploma awarding the degree and certificate of graduation must be submitted. To transfer graduate credits from a foreign institution, a student must have his or her transcript evaluated, on a course-by-course basis, by an NSU-approved agency.

c) For master's degree programs, the applicant must have a university-level education at least equivalent to an American bachelor's degree in a related field (see specific requirements). Official transcripts (see paragraph 2. above) must show an equivalent undergraduate GPA of at least 2.5 and an equivalent GPA of 3.0 in a major field. The admissions office may require the applicant to submit an evaluation from an independent agency.

The Einstein Library is a member of SEFLIN and FLIN, cooperative library networks that provide quick access to materials throughout Florida. The library also has lending agreements with large research libraries in the Midwest, which provide priority document delivery services to students. The Einstein Library is a cooperating library of the Foundation Center in New York, giving students access to collections for grants and foundation research.

Distance education students have access to books, journal articles, microfiche, dissertations, index searches, catalog searches, and reference librarians. Distance students may request library materials using fax, mail, or online forms. To contact Distance Library Services (DLS) by phone, call 1-800-541-6682, ext. 4602 or (954) 262-4602. Use the toll-free fax to order library materials: 1-888-347-3627 (in Broward County, fax 262-3947). Students can send email to DLS: library@nsu.nova.edu, or can reach DLS via the Web: www.nova.edu/library. All materials mailed by the DLS office are sent by first-class mail. When books are borrowed, the student will have to pay a small charge for third-class postage to return the books. Books are loaned for one month. Periodical copies or ERIC documents need not be returned. Also, for distance students, the university has made possible the use of many local libraries. The SCIS admissions office provides information to new students about libraries in their geographical area that are included in this arrangement and the procedures to follow.

The Einstein Library also maintains the East Campus Branch Library, which is located on the second floor of the Tower Building of the East Campus. This library supports the academic programs at the East Campus with reference services, library instruction, document delivery, and online services. For more information about these services, call (954) 262-4629.

Student Research Involving Human Subjects

All students must be aware of the university's policy regarding research involving human subjects. If you plan to do surveys (email, telephone, regular mail), interviews, testing or any other types of assessments involving human subjects as part of your dissertation, the instruments and protocols must be reviewed by the university's Institutional Review Board (IRB). The purpose of the IRB is to protect the rights of human subjects involved in research and ensure appropriate practices are being carried out at NSU. SCIS has a representative to the IRB who can help students with the review process. There are three levels of review: exempt, expedited, and full review. The SCIS representative guides students regarding the level of review required and assists with any paperwork and procedures that might be required. Most research at SCIS falls into the exempt category, which requires a rather simple process, but it must be logged appropriately. Students should contact the SCIS IRB representative by the time they start working on their preliminary proposals. Courses also may involve human subject research. In most cases, faculty members secure approval in advance for all students in the course. If you plan to conduct human subject research in a project course or as independent study you should raise the matter with your professor. Students may obtain additional information from the program office and from www.nova.edu/cwis/ogc/irb.html.

Teaching Assistantship Program

The school has a limited number of teaching assistantship positions. To be considered for a teaching assistantship, candidates must have a master's degree in a related field and must be a student in an SCIS doctoral program. Teaching assistants will spend from 20 to 30 hours per week at the university. The assistantship program will include tuition and fees; however, other expenses, e.g., books, are not included. Medical insurance would be available under the monthly employee plan. Residence within daily commuting distance to the campus will be required. Each award will include a one-year renewable contract with renewal based on faculty evaluation.

Teaching assistants may teach undergraduate and graduate courses, assist faculty with coursework, counsel students, conduct literature searches, assist in the preparation of course syllabi, evaluate textbooks, grade papers and projects, and participate in technical/research projects. In order to teach graduate courses, the teaching assistant must have completed 18 doctoral credits.

Interested current SCIS doctoral students must submit an application, including an up-to-date curriculum vita, cover letter, and three letters of recommendation from SCIS faculty members on SCIS recommendation forms. For information and applications, call (800) 986-2247, ext. 2041.

Financial Information

Tuition and Fees

Academic, program, and online services are provided only to SCIS students who are currently registered. Students who are not registered are not entitled to receive services. Students who have *Incomplete* grades to resolve must register for *Continuing Services* (see table below for costs). Doctoral students must be registered for courses, course-extending projects, or Continuing Dissertation to receive the support of the faculty on the dissertation process.

Master's Degree Programs (Rates are subject to change):

Tuition	$370 per credit hour
Application Fee	$50 non-refundable
Orientation Fee	$60 non-refundable
Registration Fee	$30 non-refundable
Late Registration Fee	$100 non-refundable
Reinstatement Fee	$50 non-refundable
Graduation Fee	$75
Deferment Fee for Installment Payment	$50
Continuing Services	$160 (leave of absence with online privileges per term)

Doctoral Degree Programs: (Rates are subject to change)

Tuition : 2 core courses and 1 project course	$4,150 per term (courses/projects are $415/credit-hour)
Application Fee	$50 nonrefundable
Registration Fee	$30 nonrefundable
Late Registration Fee	$100 nonrefundable
Reinstatement Fee	$50 nonrefundable
Graduation Fee	$75
Deferment Fee for Installment Payment	$50
Tuition for Dissertation I or II	$4,500 per term
Tuition for Continuing Dissertation	$2,250 per term
Continuing Services	$415 per Incomplete (I) grade per term

Tuition and fees are subject to change. Textbooks are not included and must be purchased by the student. Students are responsible for their own lodging and travel expenses. Students must be registered to gain access to NSU's computing services.

Tuition Payment Policy

Tuition and fees may be satisfied with payment by check, money order, credit card, or official financial aid award letter with associated financial aid documentation. Cash will not be accepted as payment for tuition and fees unless paid at the Office of the University Bursar. All postdated checks or credit card authorizations will be held by the university for processing until the due dates specified in this policy. The tuition payment policy is subject to change at any time at the discretion of the administration of Nova Southeastern University. There are five options available for the payment of tuition. These options are described below:

a) *Full Payment by the Student.* Full payment of tuition and fees is to be made at the time of registration. Registration after the registration period, when permitted, will involve payment of a late registration fee.

b) *Installment Payment by the Student.* The student may elect an installment payment plan which requires three payments spread over the first 90 days of the term. The first payment must be made by check, money order, or credit card. At the time of registration, the student must submit postdated checks or credit card authorizations for the second and third installments. The first payment, due at registration, includes all fees, 50 percent of the tuition, plus a $50 deferment fee. The second payment, due 60 days from the beginning of the term, shall equal 25 percent of the tuition. The third payment, due 90 days from the beginning of the term, shall equal 25 percent of the tuition. **Registrations received without the three payments cannot be processed.**

c) *Direct Payment by the Student's Employer.* If a letter of commitment or a voucher from the student's employer accompanies the registration form, then the student will not be required to make a payment at registration time. The letter of commitment or the voucher must indicate that the employer will remit full payment of tuition and fees to Nova Southeastern University upon receipt of the invoice from the university's accounts receivable office.

d) *Tuition Reimbursement by the Student's Employer.* If the student submits a letter from the employer at registration time that establishes eligibility for tuition reimbursement, the student may choose a two-payment plan. The first payment, due at registration, shall include all fees, 50 percent of the tuition, plus a $50 deferment fee. The second payment, due five weeks after the end of the term, shall equal 50 percent of the tuition. To secure this plan, the student must provide, at registration, a postdated check or credit card authorization for the deferred portion.

e) *Financial Aid Award.* If a student has received an official financial aid award letter and all documents have been completed, then the student may register without payment. If a student's application for financial aid is still being processed at the time of registration, then the student must register using the installment payment option (see b above).

Refunds

To receive a full refund of tuition (not including registration fees or application fees), a student must cancel any registration, enrollment contract or financial agreement made with the university and such cancellation must be made in writing within three working days from the date such payment is due. A student withdrawing from a course may be eligible for a refund (full or partial) depending on the date of withdrawal. The section Withdrawal and Refund Policy describes the refund policy regarding withdrawals. **Failure to attend classes does not automatically drop or withdraw a student from the class or the university.**

Financial Aid

The Office of Student Financial Aid administers the university's financial aid programs of grants, loans, scholarships, and student employment, and provides professional financial advisors to help students plan for the most efficient use of their financial resources for education. Underlying the awarding of financial assistance is the philosophy that students have a responsibility to contribute from their earnings and savings toward their education. Financial aid resources serve to supplement the student's financial resources. In order to participate in financial aid programs, a student must be admitted into a university program, and must be a citizen, a national or permanent resident of the United States, or be in the United States for other than a temporary purpose. Proof must be provided to the Office of Student Financial Aid. **A prospective student who requires financial assistance must apply for financial aid while he or she is a candidate for admission.** To continue financial aid, at a minimum, enrolled students must demonstrate satisfactory academic progress toward a stated educational objective in accordance with the university's policy on satisfactory progress for financial aid recipients.

Students and prospective students may apply for financial aid online at www.nova.edu/cwis/finaid.

For financial aid information or application forms contact:

Office of Financial Aid
Nova Southeastern University
3301 College Avenue
Fort Lauderdale, Florida 33314-7796
(954) 262-3380 or toll free 800-522-3243

The SCIS program offices do not administer or manage the financial aid process. Students must work directly with the Office of Student Financial Aid.

Additional information about financial aid can be found in the section Policies Governing Student Relations.

Registration

Academic Advising and Registration

Academic advising is provided by the student's program office in concert with the faculty. With the support of the program office and the faculty, each student will develop a program plan which, after approval, will remain on file in the student's program office. From time to time, a revised program plan may be submitted and approved. Each student must have an approved program plan in order to register. The registration process begins when the program office sends each student a registration packet which contains class schedules and information about the registration period and the registration process.

Deadlines

Students are expected to register during the announced registration period. Registration after the close of the registration period, when permitted, will require the payment of a late fee.

Drop/Add Periods

Master's degree students:

Registered students may drop/add a course prior to the first day of the term and up to and including the sixth calendar day of the term (the drop/add period) without penalty. If a course is dropped between the first day of the term and the end of the drop/add period and another course is not added in its place, the withdrawal policy applies. Failure to attend classes does not automatically drop or withdraw a student from the class.

Doctoral degree students:

Registered students may drop/add a course prior to the first day of the term and up to and including the second day of classes (the drop/add period) without penalty. If a course is dropped between the first day of the term and the end of the drop/add period and another course is not added in its place, the withdrawal policy applies. Failure to attend classes does not automatically drop or withdraw a student from the class.

Withdrawal and Refund Policy

Students Registered for Master's Courses:

When a student withdraws from a course, the transcript will show a grade of W for the course. A request for tuition refund must be made *in writing* at the time of withdrawal. Students withdrawing between the first and the ninth calendar day of the term will receive a 90 percent refund of tuition paid. Students withdrawing between the 10th and the 21st calendar day of the term will receive a 50 percent refund of tuition paid. Students withdrawing between the 22nd and the 42nd calendar day of the term will receive a 25 percent refund of tuition paid. Students withdrawing after the 42nd calendar day of the term will receive no refund. **Requests for withdrawal received after the last day of the term will not be accepted. Failure to attend classes or participate in course activities does not automatically drop or withdraw a student from the class or the university.** If a student is using one of the payment plans (see the section Tuition Payment Policy, p.7), the tuition due or the amount refunded will be adjusted accordingly.

Students Registered for Doctoral Courses:

When a student withdraws from a course, the transcript will show a grade of W for the course. A request for tuition refund must be made *in writing* at the time of withdrawal. Students withdrawing between the first and the 15th calendar day of the term will receive a 90 percent refund of tuition paid. Students withdrawing between the 16th and the 38th calendar day of the term will receive a 50 percent refund of tuition paid. Students withdrawing between the 39th and the 76th calendar day of the term will receive a 25 percent refund of tuition paid. Students withdrawing after the 76th calendar day of the term will receive no refund. **Requests for withdrawal received after the last day of the term will not be accepted. Failure to attend classes or participate in course activities does not automatically drop or withdraw a student from the class or the university.** If a student is using one of the payment plans (see the section Tuition Payment Policy, p.7), the tuition due or the amount refunded will be adjusted accordingly.

Auditing a Course

To audit a course, degree and non-degree students must request permission from the program office in which the course is offered. Audited coursework will appear on the student's official transcript with the grade of AU. An auditor may attend classes, submit assignments, and take examinations. Registered students may change from credit to audit status or audit to credit status during the drop/add period. A previously audited course may be taken for credit at a later date. Also, a student may audit a course previously taken and passed. Persons may not attend a class without being properly admitted to the university and registered in the class. The usual tuition and fees apply to all audited courses.

Academic Information and Policies

Student Original Work (See also Student Rights and Responsibilities)

Each student is responsible for maintaining academic integrity and intellectual honesty in his or her academic work. It is the policy of the School that each student be academically honest, which means that each student must:

a) Submit his or her own work, not that of another person

b) Not falsify data

c) Not engage in cheating (giving or receiving help during examinations, acquiring and/or transmitting test questions prior to an in-class examination, or falsifying any records, including admissions material)

d) Not receive nor give aid on assigned work that requires independent effort

e) Properly credit the words or ideas of others according to accepted standards for professional publications (See, for example, *The Publication Manual of the American Psychological Association.*)

f) Not use term paper writing services or consult such services for the purpose of obtaining assistance in the preparation of materials to be submitted in courses

g) Not engage in plagiarism

Webster's defines plagiarism as "stealing or passing off ideas or words of another as one's own" and "the use of a created production without crediting the source." Extreme caution must be exercised by students involved in collaborative work to avoid questions of plagiarism.

Refer also to the section Student Misconduct (p. 14) and the section Procedures for Resolving Allegations of Student Misconduct (p. 14).

Form and Style Requirements for Student Work

The book *Bugs in Writing* (Dupré, 1998) contains valuable guidance on professional writing and is specifically oriented to computer professionals. The *Publication Manual of the American Psychological Association, Fourth Edition* (1994) is also helpful, and you should give particular attention to Chapter 1 (Content and Organization of a Manuscript), Chapter 2 (Expression of Ideas), and Chapter 3 (Editorial Style). Chapter 2 has good advice on writing style, grammar, and guidelines to reduce bias in language. Another excellent style guide is *The Chicago Manual of Style, 14th Edition*, (University of Chicago Press).

These books provide general guidelines for form, style, and general writing principles in the preparation of papers, assignments, and reports. They contain guidance on punctuation, spelling, capitalization, abbreviations, quotations, numbers, statistical and mathematical material, tables, figures, footnotes, appendixes, and reference citations in text. Doctoral students must follow the policies, procedures, and formatting requirements contained in the SCIS Dissertation Guide for the planning and preparation of the doctoral dissertation. For reference lists, students must follow the instructions given in the section Reference List and Annotated Bibliography of the SCIS Dissertation Guide.

Attendance Policy

Master's degree students are expected to be present at each meeting of their classes on campus. Exceptions to this rule may be made in the case of illness and possibly in other instances when approved by the instructor. Students should advise their instructors in advance of any anticipated absences. Additional work may be required by an instructor for any absence. Excessive absences will result in a failing grade. For online master's courses, participation/attendance policies will be covered in the syllabus of each course.

Doctoral degree students are required to attend all of their scheduled clusters or institutes. Students are cautioned that they will risk dismissal from the doctoral program should they miss institutes or clusters. Exceptions to this rule may be made by the program director in the case of illness and possibly in other hardship situations. Absence from individual class sessions must be approved by the instructor. Students are required to advise the program office and their instructor in advance of any anticipated absences. Participation/attendance policies regarding the online components of doctoral courses will be covered in the syllabus of each course.

Grading System

Students will be assigned grades for courses and projects according to the following system:

Grade	Grade Points	Meaning of Grade
A	4.0	Superior performance.
A–	3.7	
B+	3.3	
B	3.0	Satisfactory performance.
B–	2.7	
C+	2.3	
C	2.0	
C–	1.7	Lowest acceptable grade for graduate credit.
F	0.0	Extremely unsatisfactory performance. Cannot be used to satisfy degree requirements.
I		A temporary grade assigned for incomplete work. See the section The Grade of Incomplete (I), p. 12, for school policy.
W		Withdrawn from course. See the section The Grade of Withdrawn(W), p.12, for school policy.
PR		Progress. May be assigned to master's thesis or doctoral dissertation registration. Carries credit hours but no quality points. Indicates progress toward completion of a thesis or dissertation.
NPR		No Progress. May be assigned to master's thesis or doctoral dissertation registration. Carries credit hours but no quality points. Indicates no progress or inadequate progress toward completion of a thesis or dissertation. Repeated NPR grades may result in evaluation for dismissal (see p. 35).
P		Pass. Thesis and dissertation grades of PR and NPR will be changed to P when the thesis or dissertation report receives final approval.
AU		Audit. For students who register for a course on an audit basis.

To determine the grade point average (GPA), divide the sum of all the grade points earned in graduate courses taken toward the graduate degree by the number of course credit hours taken toward that degree. Only those courses and projects taken toward the degree that carry grade points, except repeated courses and transfer credits, are included in the computation of the GPA. The grades of I, W, P, PR, and NPR do not affect the GPA. With the exception of the grade of I, once a final grade in a course has been recorded by the Office of the Registrar it can be changed only in cases of computational error or other justifiable cause approved by the dean. (Refer to Challenge of Course Grade.) A student may not do additional work nor repeat an examination to raise a final grade.

The Grade of *Incomplete (I)*

The grade of Incomplete (I) will be granted only in cases of extreme hardship. In such cases, a student requiring an incomplete must submit a written appeal with full rationale to the instructor at least two weeks prior to the end of the term. **The student does not have a right to an incomplete, which may be granted only when there is clear evidence of just cause.** Should the instructor agree, an *incomplete contract* will be prepared by the student and signed by both student and instructor. The incomplete contract must contain a description of the work to be completed and a completion date. **The completion period should be the shortest time possible.** In no case may the completion date extend beyond 30 days from the scheduled course completion date for master's courses nor beyond 60 days from the scheduled course/project completion date for doctoral courses. The incomplete contract will accompany the formal submission of the instructor's final grade roster to the student's program office. The program office will monitor each incomplete contract and if a grade change is not submitted by the scheduled completion date, the grade will be changed from I to F. No student may graduate with an I on his or her record. The grade of I does not apply to master's theses or doctoral dissertation registrations.

The Grade of *Withdrawn (W)*

A student wishing to withdraw from a course or project after the end of the drop/add period must submit a *written request* to his or her program office. **Requests for withdrawal received after the last day of the term will not be accepted.** When a student withdraws, the transcript will show a grade of W for the course or project. Failure to attend classes does not automatically drop or withdraw a student from the class or the university. A request for a tuition refund must be made *in writing* at the time of withdrawal. For the refund schedule, see the section Withdrawal and Refund Policy, p. 9.

Repeating a Course

A graduate student who has passed a course or project with a grade of B or above is not permitted to repeat it for credit. A graduate student may repeat a course or project in which a grade of C or below has been earned but credit toward the degree and the GPA will be granted only once. Permission for repeating a course or project must be obtained from the student's program office. The transcript will show both the original and repeat grades, however, only the higher grade will be counted in the computation of the student's GPA. Students repeating a course must pay course tuition and fees.

Academic Standing

Students must maintain a cumulative grade-point average (GPA) of at least 3.0 to remain in good academic standing. (See the section Grading System, p. 11, for a description of the GPA computation.) A student whose GPA falls below 3.0 is automatically placed on academic probation. Students on academic probation will not be permitted to graduate. Also, academic probation may adversely affect financial aid. If the GPA is not raised to 3.0 within two terms, the student may be dismisssed from the program. A student on academic probation will be allowed to continue graduate study in subsequent terms if each term's grade-point average is 3.0 or greater. Upon achieving a cumulative GPA of 3.0, the student will be removed from probationary status. Doctoral students who received NPR grades for successive dissertation registrations may be evaluated for probation or dismissal (see Evaluation of Dissertation Progress, p. 35.

Reinstatement

A dismissed student may petition his or her program office for reinstatement after six months. The petition should explain the reasons why academic potential has changed and reinstatement should be considered. Reinstatement will be evaluated by the Academic Review Committee. Reinstated students unable to achieve a GPA of 3.0 in their program during the two terms following reinstatement will be dismissed from the school and will not be eligible for reinstatement.

Time Limitations

Students in a master's degree program must complete requirements for the degree within five years from the date of their first registration. Students in a doctoral degree program must complete requirements for the degree within seven years from the date of their first registration. Students may petition the program office in writing for an extension of time, which may be granted only if the petition presents justifiable cause and an acceptable plan for program completion. Petitions for extension must be received in the program office at least three months before the time limit is reached. Doctoral students must be close to completing the dissertation and must obtain a recommendation for extension from their dissertation advisor. Extensions must be approved by the program director and the dean. When the time limit has been exceeded, and in the absence of a petition for extension, the student will be automatically dismissed from his or her program.

Inactive Status

Students who fail to register are considered to be *inactive.* Inactive students are not eligible for academic services from faculty and staff and are not eligible to receive computing, library, and other university services. An inactive student who has not registered for one or two consecutive terms will be reactivated with no academic penalty upon registration. An inactive student who has not registered for one year must petition the program office in writing for reinstatement and submit a reinstatement fee of $50. Students who are reinstated will be required to meet all program requirements and policies in effect at the time of reinstatement. Reinstated students must still meet their degree program time limitations based on the date of their first registration in the program unless extensions were granted at the time of reinstatement.

Student Records and Transcripts

The university maintains a system of record keeping and provides students with official grade reports and transcripts reflecting their academic progress. This system documents all official information from the time of application for admission to graduation. Official hard copies of records are maintained by the registrar's office.

Records are secured via the computerized student information system in addition to back-up hard copy files. Computer files are secure and kept up to date. The registrar's office follows the American Association of Collegiate Registrar's and Admissions Officer's (AACRAO) guidelines for the retention and disposal of records. After the appropriate time period, hard copy files are retired to storage. Computer files are moved to historical files and permanent records are microfilmed for later reference. Students may obtain copies of their transcripts, however, a transcript of a student's academic record cannot be released until after all of his or her accounts, academic or nonacademic, are paid.

Upon completion of a degree program at the university, students receive one transcript without charge. Any other transcripts, before or after graduation, must be specifically requested. For these, there is a $5 fee for each official transcript requested. To obtain an official transcript, a written request is required. You may obtain a *transcript request form* in the registrar's office, or put a request in a letter addressed to the Office of the University Registrar, 3301 College Ave., Ft. Lauderdale, FL 33314. Indicate your name, address, social security number, and provide answers to the following questions:

In what program were you enrolled? When did you attend? If you graduated, what date?
Do you want to delay processing because of term grades, change of grades, or conferral of degree?
How many transcripts do you want? Where should they be sent?

To receive an unofficial transcript by fax you must send a signed request or fax a request to (954) 262-7265.

Challenge of Course Grade

With the exception of the grade of I, once a final grade in a course has been recorded by the Office of the Registrar it can be changed only in cases of computational error or other justifiable cause approved by the dean. A student may neither do additional work nor repeat an examination to raise a final grade.

A student who wishes to challenge a grade assigned for an entire course must first discuss the matter with the instructor within 10 days of receipt of the grade. If the student and the instructor do not resolve the issue satisfactorily, the student must (within 10 days of the discussion with the instructor) provide a written letter of appeal to the appropriate program director or assistant program director with a copy to the instructor. The student must establish the reasons for requesting a change in grade. On receipt of the letter, the appropriate program director or assistant program director must schedule two conferences, one with the student and another with the instructor. These conferences must be held within 10 days of receipt of the letter by the program office.

If the issue is not resolved satisfactorily during the individual conferences, the program director or assistant program director will schedule (within two weeks) and preside at a joint conference (may be conducted by telephone or online) with both the student and the instructor present. If the student is not satisfied with the result of the joint conference, he or she will not be permitted a further appeal unless evidence of discrimination or a violation of the student's rights is presented. If such evidence is presented, then the Student Grievance Procedure, p. 14, shall be followed.

Student Misconduct

The school will not tolerate acts of academic dishonesty or behavior that are clearly unethical, unprofessional, flagrantly disruptive, or that violate the general understanding of the proper conduct of graduate students. Commission of an act of misconduct will subject the student to dismissal from the university. Individual cases will be examined by the Academic Review Committee which will present its findings to the dean for adjudication. (See the sections: Student Rights and Responsibilities; Code of Student Conduct and Academic Responsibility; and Code of Computer Ethics.

Procedures for Resolving Allegations of Student Misconduct

Allegations of student misconduct must be made in writing to the student's program office by a faculty member, staff member, or student. All pertinent factors, witnesses, events, and evidence related to the alleged misconduct should be included. If the allegations constitute *probable cause* to proceed, the program director or assistant program director will notify the accused in writing that an inquiry will be conducted by the Academic Review Committee.

As part of the inquiry, all pertinent documentary evidence and statements from witnesses will be assembled. The accused will be given an opportunity to provide a written response to the allegations. The Academic Review Committee will submit its findings and recommendation to the dean. When misconduct is indicated beyond reasonable doubt, the penalties may be: admonition, suspension, or dismissal. In such case, a report of the findings and penalty will be provided to the accused who may acquiesce in the penalty or may contest and ask for a hearing.

Failure of the accused to respond within 20 days shall be construed as acquiescence in the report of the inquiry. If a hearing is requested, it will be conducted by the Academic Review Committee. If, after the hearing, the committee finds the accused guilty of misconduct, it will provide the dean with a report of the hearing. The dean will decide on the final action to be taken.

Student Grievance Procedures

This section describes procedures for student grievances regarding academic matters. If the issue concerns the fairness of a grade, the procedure described in the section Challenge of Grade, p. 13, must be followed.

First, the student should attempt to resolve an issue in dispute at the level at which the dispute occurred, for example, with the appropriate faculty member or program director. This attempt must be in writing (e.g., email, regular mail, or fax). The student may wish to use certified mail to verify receipt of correspondence. In the correspondence, the student must present a rationale for his or her position based on factual information. The student will receive a reply from the recipient, in writing, that addresses the complaint.

If the reply is not acceptable, the student is encouraged to submit the complaint in writing, to the next higher level, e.g., the appropriate program director. If the program director is unable to resolve the dispute, he or she will notify the student and the dean of this in writing.

The student may then appeal in writing to the dean of The School of Computer and Information Sciences. The dean will attempt resolution. If appropriate, the dean may assign the matter to the Academic Review Committee consisting of at least three faculty members of the school, one of whom will be appointed chair. The committee will meet, carefully review the case, and make a written recommendation, including rationale, to the dean to either accept or reject the student's appeal, or may propose an approach to resolve the dispute. The dean will review the findings and recommendations of the Academic Review Committee, and will notify the student in writing of his or her decision. The Dean's decision is final and cannot be appealed.

Textbooks

Book information can be found on the SCIS Web site. Click on "Textbooks" and then click on the term schedule for your program. When you reach your program, click on the "Book Info" link for each course.

SCIS students must find their own sources to purchase textbooks. Possible sources include online booksellers and national bookstores. Students may find online purchasing to be faster and less expensive. Inquiries as to availability via the Internet may be made to online booksellers such as:

Computer Literacy: www.cbooks.com

Amazon Books: www.amazon.com

Borders Online: www.borders.com

Barnes & Noble: www.barnesandnoble.com

Other possible sources may be found via Internet search. Discounts are often available. Students should compare prices, availability, and shipping options.

Students should place their orders early enough to ensure delivery prior to the start of the term. Please note that some texts may involve a wait of six to eight weeks.

There will be occasions when books are not available for the start of the term because they are out of stock or temporarily out of print. In such cases, faculty will ensure that courses progress according to their schedules.

Student Services

Student ID Cards

Registered students are issued student ID cards. These are required to check out books from the Einstein Library. A number of businesses in the community will give students discounted rates on a variety of services ranging from movies to dinner if an ID card is shown. If an ID card is lost or destroyed, a new one may be requested at the registrar's office. There is an additional fee to replace a lost card.

Student Housing

On the main campus, one-bedroom and two-bedroom furnished and unfurnished apartments are available for graduate and married students without children. Utilities, basic cable TV, and central air conditioning are included in the housing rates. Interested students are invited to obtain further information from the university's Office of Residential Life, (954) 262-7052 or (800) 541-6682, Ext. 7052.

Travel Services

Nova Southeastern University has a full-service travel agency in the Horvitz Administration Building that can make reservations and issue airline tickets and reserve rental cars. In addition, travel agents can also help make arrangements for trips and vacations. NSU's travel service accepts money orders and major credit cards. The travel agency can be reached at (954) 262-8888 or toll free (800) 541-6682, ext. 8888.

Graduation

Graduation Requirements

All degree-seeking students must complete the minimum credits as designated for the chosen program, plus meet the following requirements:

a) Admission as a degree-seeking candidate in one of the programs.

b) Satisfy program requirements including completion of courses, master's thesis where appropriate and, for the doctorate, an approved dissertation as specified in program documentation.

c) Doctoral students: Attendance at all required cluster or institute meetings.

d) Attainment of a cumulative grade point average of at least 3.0.

e) Payment of all tuition and fees.

f) Completion of graduation application form and payment of graduation fee. Application forms may be obtained from the program office or the office of the registrar. Master's students should complete the form at the time of registration for their final term. Doctoral students should complete the form upon written notification of acceptance of their dissertation report.

g) Fulfillment of all obligations to the library, the student's program, and the comptroller's office.

h) Removal from provisional admission status and conditional admission status (see page 18.).

Commencement

A commencement ceremony is held in June for Nova Southeastern University graduate students. All graduating students are encouraged to participate in this ceremony. In order to participate, students must complete all graduation requirements at least six weeks prior to the date of the commencement ceremony.

Students eligible to participate should request an application for graduation from their program office. The program office will advise the university registrar of eligible students, and the registrar will distribute commencement procedures to these students.

Alumni Association

Nova Southeastern University has an active alumni association that is a division of the Office of University Relations and Development. The association is organized on three levels — local, state, and national — that work in concert to provide special programs and other services that promote the professional and intellectual growth of graduates and maintain communications between graduates and the university. The Office of University Relations and Development also offers a credentials file service. Additional information can be obtained from the Office of Alumni Affairs: (954) 262-2118.

Master's Degree Programs

General Information on Master's Degree Programs

Application for Admission

Admission decisions are made on a rolling basis. To ensure evaluation for the desired starting term, applications should be received at least two months prior to the start of that term. Unofficial copies of transcripts are acceptable for early review. Applicants may be granted *provisional admission* status pending completion of the application process (see p. 18). Late applications that cannot be processed in time for the desired starting term will be considered for the next available term. To obtain information or application forms contact:

The School of Computer and Information Sciences
Nova Southeastern University
P.O. Box 290600
Fort Lauderdale, FL 33329-0600

800-986-2247, ext. 2000 or (954) 262-2000
Email: scisinfo@scis.nova.edu
Web Site: www.scis.nova.edu

Applicants must meet the requirements and submit the documents specified below **and must also satisfy the program-specific admission requirements contained in the individual program sections of this catalog.** Detailed instructions for the preparation and mailing of admissions materials are contained in the school's Application for Admission packet.

a) An earned bachelor's degree from a regionally accredited institution with an appropriate major (see program-specific admission requirements).

b) A completed application and application fee.

c) Official transcripts of all graduate and undergraduate education showing an undergraduate GPA of at least 2.5 and a GPA of 3.0 in a major field.

d) Three letters of recommendation from individuals able to assess the applicant's intellectual ability, maturity, and motivation. Recommendations from friends, family members, or other individuals who are not able to evaluate the applicant on an academic or professional basis are unacceptable.

e) A comprehensive portfolio of relevant professional experience and credentials, or score report of the Graduate Record Examination (GRE).

f) Proficiency in the English language is a prerequisite for graduate study at the School of Computer and Information Sciences. Master's students are expected to write numerous papers. It is very important to note that grammatical errors, spelling errors, and writing that does not express ideas clearly will affect a student's grades and the completion of his or her degree. The faculty will not provide remedial help concerning grammatical errors or other writing problems. Applicants who are unable to write correctly and clearly are urged to seek remedial help before enrolling in any of the school's programs.

g) Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL). A minimum test score of 550 is required for applicants taking the written examination. A minimum test score of 213 is required for applicants taking the computer-based examination. (Scores must be no more than two years old.) Test results must be sent directly to the School of Computer and Information Sciences from TOEFL/TSE Services, P.O. Box 6153, Princeton, NJ, 08541-6153, USA; phone: (609) 771-7100; fax: (609) 771-7500, Web site: www.toefl.org.

h) Students on J-1 visas are required to secure an affidavit of support, from an agency or government who will be the financial sponsor, stating that they have a sufficient amount of money to support themselves for the duration of their study. Students on F-1 visas need an affidavit of support and a notarized/attested financial statement proving that they have a sufficient amount of money to support themselves for one academic year (generally nine months). The section Admission of International Students contains additional information regarding international student requirements.

Provisional or Conditional Admission

A degree–seeking applicant who has missing documents but appears to be acceptable based on documents received by SCIS may be offered *provisional admission.* Official admission will be granted upon receipt and acceptability of the remaining required documents. All missing documents must be submitted prior to the student's second registration. Examples of missing documents are an official transcript and a letter of recommendation. An applicant who has not met all admission requirements may be given *conditional admission* if sufficient evidence exists to suggest the ability to perform successfully in the program. A student with *conditional* status must remove stated deficiencies before applying for graduation.

Transfer Credit Policy

Up to six graduate credits may be transferred from a regionally accredited institution. Courses proposed for transfer must have received grades of at least B. Students must request approval of transfer credits in writing at the time of application (see instruction on the application form). Copies of catalog course descriptions or course syllabi are required to process requests for transfer credits.

Additional Information on Admissions

Additional information on the admissions process is contained in the section General Information on SCIS Graduate Programs.

Orientation and Advisement

New students are invited to attend an orientation weekend on the campus in Fort Lauderdale which includes introductions to the program office staff and faculty, computer requirements, online access, software tools that enhance the educational process, and library services available to on-campus and online students. Advisement is conducted regularly by the student's program office and the faculty.

Early Admission into the Doctoral Program (See specific options in the individual M.S. program sections)

This option provides the opportunity to earn the Ph.D. or Ed.D.in a shorter time. Students must first be admitted into the school's master's degree program. Requirements for early admission into the doctoral program are the completion of 24 credits in the master's program with a GPA of 3.25 or higher. Students may apply for early admission in the doctoral program during the term in which they will be completing 24 credits (8 courses) in the master's program. It is preferred that students apply early in the term to allow time for processing their application. Students must submit a doctoral application form to the SCIS Admissions Office which must include: (1) an application form, (2) a letter of intent, (3) an updated curriculum vitae, (4) at least one letter of recommendation from an SCIS faculty member familiar with the student's course work, and (5) official transcripts of graduate courses taken at other institutions while an SCIS master's student. Items that are not required: (1) application fee, (2) essay, (3) portfolio or GRE score, (4) transcripts of SCIS course work, and (5) request for unix account. If admitted into the doctoral program, the student may apply to the Master's Program Office for graduation and conferment of the master's degree after completing 12 credits in the doctoral program.

Thesis and Non–Thesis Options

For the thesis option, 30 credit hours of course work and six credit hours for the master's thesis are required. For the non-thesis option, 36 credit hours of course work are required. Students interested in completing the master's thesis should contact the master's program office to make arrangements.

Term Dates

Terms are 12 weeks in duration and four terms are offered each year. Terms start in September, January, April, and July.

Program Formats

The 36-credit hour program is designed so it may be completed by full-time students in 12 months or by working professionals in 18 months while remaining in their current positions. To earn the degree in 12 months, students must enroll in three courses per term. To earn the degree in 18 months, students must enroll in two courses per term. Terms are 12 weeks long and there are four terms each year. Students select one of two formats: online or on campus (on-campus is not available for the M.S. in computing technology in education). With the permission of the program office, a student in one format may take a course in another format.

Its formats offer full-time students the opportunity to earn the master's degree in 12 months and working professionals the opportunity to earn the degree in 18 months

Online Format

The online format requires the completion of 12 courses via online techniques (see section on thesis option). Online courses require use of a computer (IBM-compatible PC or Apple Macintosh) and a modem from home, office, or on the road while traveling. Students participate in courses via the Internet from anywhere in the United States or outside the United States. New students are provided an orientation on computer and software requirements, online access, and online tools and methods. Students are provided NSU computer accounts but must obtain their own Internet service providers. Online, interactive learning methods are used throughout the instructional sequence. Interactive learning methods involve World Wide Web pages to access course materials, announcements, the electronic library, and other information, plus a range of online activities that facilitate frequent student–faculty and student–student interaction. Online activities may include forums using threaded bulletin boards, chatrooms, email, and electronic classroom sessions. In addition, the school provides a system that enables the student to submit assignments online in multimedia formats and to receive his or her professor's online reviews of assignments in the same multimedia formats. Students must comply with NSU policies on acceptable use of computing resources and use of material in Web pages (see pp. 58-60).

On-Campus Format (Not available for the M.S. in Computing Technology in Education)

The on-campus format requires the completion of 12 courses (see section on thesis option). Courses are held on the campus in Fort Lauderdale. Each class meets once a week from 6:30 p.m. to 9:30 p.m. for 12 weeks. On-campus students are provided NSU computer accounts but must obtain their own Internet service providers. Students may gain access to the university's computing resources from computer laboratories on the campus or from off–campus locations such as homes, offices, or elsewhere using either an IBM–compatible PC or an Apple Macintosh computer, and a modem. New students are provided an orientation on computer and software requirements, online access, and online tools and methods. Interactive learning methods may involve World Wide Web pages to access course materials, announcements, the electronic library, and other information, plus a range of online activities that facilitate frequent student–faculty and student–student interaction. Online activities may include email, forums using threaded bulletin boards, and chatrooms. In addition, the school provides a system that enables the student to submit assignments online in multimedia formats and to receive his or her professor's online reviews of assignments in the same multimedia formats. Students must comply with NSU policies on acceptable use of computing resources and use of material in Web pages (see pp. 58-60).

Grade Requirements and Time Limitations

Students must maintain a cumulative grade point average of at least 3.0 for the duration of their master's degree program. Failure to do so will result in probation and possible dismissal. Students in a master's degree program must complete requirements for the degree within five years from the date of their first registration.

Independent Study

Students wishing to take a course as independent study must first appeal to the program office. If the program office agrees, it will attempt to obtain the agreement of a faculty member to supervise the independent study and will then notify the student of its decision.

Cross-Registration

Students may apply to cross-register for courses offered in other SCIS master's degree programs. Approval for cross-registration must be obtained from the student's program office prior to registration.

Master of Science (M.S.) in Computer Information Systems

This program offers a course of study leading to the master of science (M.S.) in computer information systems. It focuses on the technological foundations of computer information systems including areas such as database systems, human-computer interaction, data and computer communications, computer security, computer graphics, software engineering, and object-orientation. It is designed to give students a thorough knowledge of the field and to provide an enduring foundation for future professional growth. The program blends theory and practice into a learning experience that develops skills applicable to complex real-world problems. Its formats offer full-time students the opportunity to earn the master's degree in 12 months and working professionals the opportunity to earn the degree in 18 months while remaining in their current positions. The curriculum is consistent with recommendations for a model curriculum in computer information systems as outlined by the Association of Computing Machinery (ACM).

Program-Specific Admission Requirements (See pp. 17-18 for general admission requirements.)

This program is designed for students with undergraduate majors in computer science, information systems, engineering, mathematics, or physics. Applicants must have knowledge of data structures and algorithms, assembly language and computer architecture, structured programming in a modern high-level language, college algebra, and discrete mathematics. An applicant who does not have an adequate background in mathematics or computer concepts may be required to take one or more of the following 500-level graduate courses during the first year of the student's program. Courses at the 500 level, when required, must be completed prior to taking courses at the 600 level, however, some exceptions may be permitted by the program office. MCIS 501 is prerequisite to MCIS 503.

MCIS 500 Assembly Language and Architecture
MCIS 501 Java Programming Language
MCIS 502 Mathematics in Computing
MCIS 503 Data Structures and Algorithms

Early Admission into the Doctoral Program

This option provides the opportunity to earn the Ph.D. in computer information systems or information systems in a shorter time. See detailed requirements in the section General Information on Master's Degree Programs.

The Curriculum for the M.S. in Computer Information Systems

Core courses and electives are listed below. The student may substitute up to two electives in lieu of two core courses. Students who wish to take an additional elective in lieu of a core course must request approval from the program office prior to registration. If the thesis option is elected, two courses may be omitted. (Plans for the thesis option must be made with the program office.)

The student may request permission from the program office to register for MCIS 682, Project in Information Systems, to pursue a project under the supervision of a faculty member in lieu of a core course.

Core Courses:

MCIS 611 Survey of Programming Languages
MCIS 615 Operating Systems Concepts
MCIS 620 Information Systems
MCIS 625 Computer Graphics
MCIS 630 Database Systems
MCIS 645 Software Engineering
MCIS 650 Data Communications Networks
MCIS 661 Object-Oriented Applications
MCIS 665 Client–Server Computing
MCIS 670 Artificial Intelligence and Expert Systems
MCIS 671 Decision Support Systems
MCIS 680 Human-Computer Interaction

Electives:

MCIS 621 Information Systems Project Management
MCIS 623 Legal and Ethical Aspects of Computing
MCIS 631 Database Systems Project
MCIS 651 Project in Data Communications Networks
MCIS 652 Computer Security
MCIS 654 Electronic Commerce on the Internet
MCIS 681 Multimedia Systems
MCIS 682 Project in Information Systems
MCIS 691 Special Topics in Computer Information Systems
MCIS 699 Master's Thesis in Computer Information Systems

Course Descriptions for the M.S. in Computer Information Systems

MCIS 500 Assembly Language and Architecture (3 credits)
A comprehensive examination of the fundamental concepts and architectural structures of contemporary computers. Complex instruction set architectures (CISC) and reduced instruction set architectures (RISC) will be studied from programming and structural viewpoints.

MCIS 501 Java Programming Language (3 credits)
An in-depth study of the Java programming language. Principles of the object-oriented paradigm. Object-oriented programming theory and practice.

MCIS 502 Mathematics in Computing (3 credits)
Graph theory, lattices and boolean algebras, state models and abstract algebraic structures, logical systems, production systems, computability theory, recursive function theory.

MCIS 503 Data Structures and Algorithms (3 credits)
Sorting and searching, algorithms for tree structures, advanced data structures, graph algorithms, complexity, dynamic programming, optimization problems. Prerequisite: MCIS 501 or equivalent.

MCIS 611 Survey of Programming Languages (3 credits)
Organization and types of programming languages. Analysis of imperative, object-oriented, and declarative language paradigms. Higher-level languages. Comparative analysis of programming languages used in the development of computer information systems.

MCIS 615 Operating Systems Concepts (3 credits)
Objectives of managing computer system resources. Memory management, process management, file system management, scheduling, synchronization, interrupt processing, distributed processing, and parallel systems. An analysis of the role of operating systems in computer information systems development, operation, and evolution.

MCIS 620 Information Systems (3 credits)
Covers major concepts and architecture of computer information systems including information concepts; information flow; types of information systems; the role of information in planning operations, control, and decision-making; integrated information systems across a range of functional elements. Computer information systems in organizations.

MCIS 621 Information Systems Project Management (3 credits)
Life-cycle models/paradigms. Project planning and risk analysis. Project control including work breakdown structures, project scheduling, activities and milestones. Software cost estimation techniques/models. Software quality assurance and metrics for software productivity and quality. Inspections, walkthroughs, and reviews. Approaches to team organization. Configuration management. Automated project management tools. Software maintenance. Information system security. Procurement of software services and systems. Management of operational systems. Legal/ethical issues associated with CIS and software.

MCIS 623 Legal and Ethical Aspects of Computing (3 credits)
Focuses on issues that involve computer impact on society and related concerns. Transitional data flow; copyright protection; information as a source of economic power; rights to access computer systems; computer crime; data privacy; establishing national priorities in the technical and social aspects of computing; current and anticipated uses of computer prediction; and protection of personal ethical concerns. National computer policies of Japan, France, Great Britain, and the European Economic Community. The status of regulation and emerging standards.

MCIS 625 Computer Graphics (3 credits)
Presents computer graphics as an aid to information managers who need a clear means of presenting the analysis of information. Topics include basic graphic techniques (e.g. histograms, bar charts, pie charts), the theory of graphic presentation of information, desktop publishing software, presentation software, graphics monitors (EGA, CGA, VGA, RGB, composite), laser printers, computer screen projection systems, and standards.

MCIS 630 Database Systems (3 credits)
Methodologies and principles of database analysis and design are presented. Conceptual modeling and specifications of databases, database design process and tools, functional analysis and methodologies for database design, entity relationship model and advanced semantic modeling methods are discussed. Topics include theories of database systems including the architectures of database systems, logical and physical database organizations, data models for database systems (network, hierarchical, relational and object-oriented model), relational algebra and calculus, query languages, normal forms, null values and partial information, relational database design utilizing dependencies, view design and integration, concurrency control, query optimization, client/server database applications, distributed databases, object oriented databases, and the current research and development trends of database analysis, design, modeling, and applications.

MCIS 631 Database Systems Project (3 credits)
The techniques of database management systems are applied to practical projects. Prerequisite: MCIS 630.

MCIS 645 Software Engineering (3 credits)
The development of software-intensive systems; software quality factors; software engineering principles; system life cycle models and paradigms; requirements definition and analysis; behavioral specification; software design; implementation; software testing techniques; verification and validation; system evolution; software project management.

MCIS 650 Data Communications Networks (3 credits)
This course covers the technical concepts of data networks, network components, associated network technologies and data communications protocols. Specification, design, testing, managing and updating of data networks from legacy systems through terabit networks is discussed. Examination of associated network components (modems, multiplexers, hub, gateways, etc.), guided and unguided media (wire, coax, fiber, terrestrial and satellite microwave, etc.) and routing and high speed switching systems. Network architecture topics include software and conceptual models (OSI, TCP/IP, HDLC and SDLC, SNA, AIX, etc.), error detection and prevention systems, transfer and routing protocols, congestion and flow control, and current and future applications (SNMP2, HTTP, X.400/500, ANS.1, ISDN and B- ISDN, ultra high speed networks, etc.).

MCIS 651 Project in Data Communications Networks (3 credits)
Students pursue a project, research study, or implementation in data communications networks. Prerequisite: MCIS 650.

MCIS 652 Computer Security (3 credits)
Concepts and principles of system and data security. Risks and vulnerabilities, policy formation, controls and protection methods, database security, encryption, authentication technologies, host-based and network-based security issues, personnel and physical security issues, issues of law and privacy. Discussions include firewall design and implementation, secure internet and intranet protocols, and techniques for responding to security breaches.

MCIS 654 Electronic Commerce on the Internet (3 credits)
Electronic commerce has grown at an incredible rate, and experts forecast extraordinary growth over the near-term and long-term. It will be examined from three perspectives: (1) customer–business, (2) business–business, and (3) intra–organization. The Internet, intranets and extranets, electronic data interchange (EDI), security, electronic payment systems, tax issues and global policy will be investigated. The student will participate in an Internet shopping experience and create or enhance a web page.

MCIS 661 Object-Oriented Applications (3 credits)
Principles of the object-oriented paradigm. Application of object-oriented methods in computer information systems. Object-oriented languages and design methods for class creation. Study of the use of object-oriented techniques in applications such as user interfaces, graphics, database systems, visual programming, hypermedia, office automation systems, and decision support systems. Techniques for software reuse.

MCIS 665 Client–Server Computing (3 credits)
Concepts and principles of client/server architecture, security, networks, and distributed computing. Topics include IPC, RPC, sockets, the role of the GUI and front-end development tools, middleware, 2-tier and 3-tier architectures, operating systems, and database interaction. The role of standards in client/server development is discussed including DCE, CORBA, ODBC, COM, and OLE, along with object-oriented aspects of client/server and distributed computing. Discussions include the various relationships between client/server computing and business process reengineering, workflow automation, and groupware. Migration from legacy systems is considered along with concerns for meeting customer requirements.

MCIS 670 Artificial Intelligence and Expert Systems (3 credits)
Includes an introduction to artificial intelligence as well as historical and current trends and characterization of knowledge-based systems. Search, logic and deduction, knowledge representation, production systems, and expert systems will be examined. Additional areas include architecture of expert systems and criteria for selecting expert system shells, such as end-user interface, developer interface, system interface, inference engine, knowledge base, and data interface. The student will use a commercial shell to build a working expert system.

MCIS 671 Decision Support Systems (3 credits)
Examines concepts of decision support in both non-automated and automated environments. Focuses on structures, modeling, and the application of various decision support systems in today's corporate environment. Additional emphasis is placed on the use of executive information and expert system applications. Case studies examine applications of each of these types of technology.

MCIS 680 Human-Computer Interaction (3 credits)
Focuses on the dynamics of human-computer interaction (HCI). Provides a broad overview of HCI as a sub-area of computer science and explores user-centered design approaches in information systems applications. Addresses the user interface and software design strategies, user experience levels, interaction styles, usability engineering, and collaborative systems technology. Students will perform formal software evaluations and usability tests.

MCIS 681 Multimedia Systems (3 credits)
Introduction to multimedia systems. Definition of terms and concepts related to multimedia. Trends in the development and use of multimedia. Tools, techniques, and guidelines facilitating the planning, design, production, implementation, and evaluation of multimedia products.

MCIS 682 Project in Information Systems (3 credits)
Students pursue a project, research study, or implementation under the supervision of a faculty member.

MCIS 691 Special Topics in Computer Information Systems (3 credits)
This seminar focuses on the professor's current research interests. Requires consent of instructor and program director.

Master of Science (M.S.) in Computer Science

This program offers a course of study leading to the master of science (M.S.) in computer science. It is designed to give students a thorough knowledge of the field and to provide an enduring foundation for future professional growth. The program blends theory and practice into a learning experience that develops skills applicable to complex real-world problems. Its formats offer full-time students the opportunity to earn the master's degree in 12 months and working professionals the opportunity to earn the degree in 18 months while remaining in their current positions. The curriculum is consistent with recommendations for a model curriculum in computer science as outlined by the Association of Computing Machinery (ACM).

Program-Specific Admission Requirements (See pp. 17-18 for general admission requirements.)

This program is designed for students with undergraduate majors in computer science, engineering, mathematics, or physics and who have completed courses or have equivalent experience in data structures and algorithms, assembly language, computer architecture, structured programming in a modern high-level language, systems software (compilers or operating systems), calculus (differential and integral calculus), and discrete mathematics. An applicant who does not have an adequate background may be required to take one or more of the following 500-level graduate courses during the first year of the student's program. These are in addition to the required 36 credit hours of courses at the 600 level. Courses at the 500 level, when required, must be completed prior to taking courses at the 600 level, however, some exceptions may be permitted by the program office. MCIS 501 is prerequisite to MCIS 503.

MCIS 500 Assembly Language and Architecture
MCIS 501 Java Programming Language
MCIS 502 Mathematics in Computing
MCIS 503 Data Structures and Algorithms

Early Admission into the Doctoral Program

This option provides the opportunity to earn the Ph.D. in computer science or computer information systems in a shorter time. See detailed requirements in the section General Information on Master's Degree Programs.

The Curriculum for the M.S. in Computer Science

Core courses and electives are listed below. The student may substitute up to two electives in lieu of two core courses. Students who wish to take an additional elective in lieu of a core course must request approval from the program office prior to registration. If the thesis option is elected, two courses may be omitted. (Plans for the thesis option must be made with the program office.)

The student may request permission from the program office to register for CISC 691, Project in Computer Science, and pursue a project under the supervision of a faculty member in lieu of a core course.

Core Courses:

CISC 610 Programming Languages
CISC 615 Design and Analysis of Algorithms
CISC 630 Compiler Design Theory
CISC 640 Operating Systems Theory and Design
CISC 650 Data Communications Networks
CISC 660 Database Management Systems
CISC 665 Client–Server Computing
CISC 670 Artificial Intelligence
CISC 680 Software Engineering
CISC 681 Interactive Computer Graphics
CISC 683 Object-Oriented Design
CISC 685 Human-Computer Interaction

Electives:

CISC 620 Modeling and Simulation
CISC 622 Numerical Analysis
CISC 631 Language Theory and Automata
CISC 632 Compiler Implementation
CISC 644 Operating Systems Implementation
CISC 647 Advanced Computer Architecture
CISC 651 Project in Data Communications Networks
CISC 654 Computer Security
CISC 661 Database Management Systems Implementation
CISC 663 Object-Oriented Database Systems
CISC 681 Interactive Computer Graphics
CISC 682 Software Engineering Implementation
CISC 690 Special Topics in Computer Science
CISC 691 Project in Computer Science
CISC 699 Master's Thesis in Computer Science

Course Descriptions for the M.S. in Computer Science

CISC 610 Programming Languages (3 credits)
Formal languages and language hierarchies, syntactic and semantic specification, abstract machines and corresponding languages, context-free languages, abstraction, modularity, and program structure. Fundamental programming language concepts. Analysis of imperative, object-oriented, and declarative language paradigms. Several programming languages will be analyzed.

CISC 615 Design and Analysis of Algorithms (3 credits)
Topics include sorting, algorithms for tree structures, dynamic programming, greedy methods, advanced data structures, divide and conquer, graph algorithms, arithmetic operations, algorithms for parallel computers, matrix operations, string/pattern matching, network problems, approximation algorithms, and NP-completeness.

CISC 620 Modeling and Simulation (3 credits)
Use of logical and mathematical models to represent and simulate events and processes as well as computer, information, and communications systems. Introduction to computer modeling techniques and discrete-event simulation. Model development and testing. Output and problem analysis. Application of techniques to a multiprocessor system model and an Ethernet model. Examination of development programs such as GPSS, SIMULA, and SIMSCRIPT.

CISC 622 Numerical Analysis (3 credits)
Introduction to error analysis, iterative methods, eigenvalue problems, integration and differentiation by computer, interpolation, ill-conditioned problems.

CISC 630 Compiler Design Theory (3 credits)
Language theory will be applied to the design of a compiler for a high-level language. Parsing, syntax analysis, semantic analysis, and code generation. Other areas of the compilation process will be covered, such as storage allocation, symbol table management, searching and sorting, and optimization.

CISC 631 Language Theory and Automata (3 credits)
Introduction to formal grammars, Backus-Naur notation. The formal theory behind the design of a computer language is studied. The corresponding types of automata which may serve as recognizers and generators for a language will be described.

CISC 632 Compiler Implementation (3 credits)
Design, implementation, and testing of a compiler for a high-level language. The project will utilize state-of-the-art compiler generation tools, including parser generators and code generator generators. Prerequisite: CISC 630.

CISC 640 Operating Systems Theory and Design (3 credits)
Analysis of computer operating systems with emphasis on structured design. Multiprogramming and multiprocessing, real time, time-sharing, networks, job control, scheduling, synchronization, and other forms of resource management, I/O programming, and memory and file system management.

CISC 644 Operating Systems Implementation (3 credits)
Implementation and testing of operating system designs. Prerequisite: CISC 640.

CISC 647 Advanced Computer Architecture (3 credits)
Organizational structures of computer systems and subsystems. Topics include processor organization, memory organization, virtual memory, microarchitecture, I/O controllers and processors, architectures for complex instruction set computers (CISC) and reduced instruction set computers (RISC), performance evaluation, multiprocessors and parallel architectures.

CISC 650 Data Communications Networks (3 credits)
This course covers the detailed technical concepts of data networks, network components, associated network technologies and data communications protocols. Technical specification, design, testing, managing and updating of data networks from legacy systems through terabit networks are discussed. Detailed technical examination of associated network components (modems, multiplexers, hubs, gateways, etc.), guided and unguided media (wire, coax, fiber, terrestrial and satellite microwave, etc.) and routing and high speed switching systems. Network architecture topics include software and conceptual models (OSI, TCP/IP, HDLC and SDLC, SNA, AIX, etc.), error detection and prevention systems, transfer and routing protocols, congestion and flow control, and current and future applications (SNMP2, HTTP, X.400/500, ANS.1, ISDN and B-ISDN, ultra high speed networks, etc.).

CISC 651 Project in Data Communications Networks (3 credits)
Students pursue a project, research study, or implementation in data and computer communications. Prerequisite: CISC 650.

CISC 654 Computer Security (3 credits)
Concepts and principles of system and data security. Risks and vulnerabilities, policy formation, controls and protection methods, database security, encryption, authentication technologies, host-based and network-based security issues, personnel and physical security issues, issues of law and privacy. Discussions include firewall design and implementation, secure internet and intranet protocols, and techniques for responding to security breaches.

CISC 660 Database Management Systems (3 credits)
Principles of database management systems. Topics include concepts of database architectures such as three schema architectures, logical and physical data organizations, data models for database systems (network model, hierarchical model, relational model and object-oriented model), relational algebra and calculus, query languages, design theory for relational databases, functional dependencies and normal forms, null values and partial information, semantic data modeling, transaction management and concurrency control, index schema, file structures and access methods, query systems and query optimization, view management, client/server database architectures, distributed databases, object-oriented databases, logic-based databases, and the current research and development trends of database systems.

CISC 661 Database Management Systems Implementation (3 credits)
Techniques of database management will be applied to practical projects. Prerequisite: CISC 660.

CISC 663 Object-Oriented Database Systems (3 credits)
Object-oriented data models and other data models with semantic extensions such as functional data models, object oriented database query model and languages, object-oriented database schema evolution and modification, version management and control, object data storage structure (clustering and indexing), query processing and transaction management, authorization mechanism and security, integrating object-oriented programming and databases, and applications of object-oriented databases. Prerequisite: CISC 660 or equivalent.

CISC 665 Client–Server Computing (3 credits)
Concepts and principles of client/server architecture, security, networks, and distributed computing. Topics include IPC, RPC, sockets, the role of the GUI and front-end development tools, middleware, 2-tier and 3-tier architectures, operating systems, and database interaction. The role of standards in client/server development is discussed including DCE, CORBA, ODBC, COM, and OLE, along with object-oriented aspects of client/server and distributed computing. Discussions include the various relationships between client/server computing and business process reengineering, workflow automation, and groupware. Migration from legacy systems is considered along with concerns for meeting customer requirements.

CISC 670 Artificial Intelligence (3 credits)
Basic principles and techniques of artificial intelligence will be covered. Concepts of knowledge representation including formalized symbolic logic, inconsistency and uncertainty, probabilistic reasoning, and structured knowledge will be presented. Other areas are (1) knowledge organization and manipulation including search and control strategies, matching techniques, and knowledge management, (2) perception and communication including natural language processing and pattern recognition, and (3) the architecture of expert systems.

CISC 680 Software Engineering (3 credits)
The development of software-intensive systems; software quality factors; software engineering principles; system life cycle models; requirements definition and analysis; behavioral specification; software design; implementation; software testing techniques; verification and validation; system evolution; software project management.

CISC 681 Interactive Computer Graphics (3 credits)
Principles of interactive computer graphics. Concepts include fundamental raster operations such as scan conversion, fill methods, and anti-aliasing; transformations; graphic languages such as PHIGS and Open GL; projection; hidden surface removal methods; 3D modeling techniques; ray tracing; animation; and graphical user interfaces.

CISC 682 Software Engineering Implementation (3 credits)
Techniques of software engineering will be applied in projects. Prerequisite: CISC 680.

CISC 683 Object-Oriented Design (3 credits)
The concepts and principles of the object-oriented paradigm. Approaches to analyzing and modeling a system using object-oriented techniques. Techniques for the design of objects, classes, and modules. The use of inheritance to enhance reusability. Object-oriented analysis and object-oriented programming.

CISC 685 Human-Computer Interaction (3 credits)
Focuses on the dynamics of human-computer interaction (HCI). Provides a broad overview of HCI as a sub-area of computer science and explores user-centered design approaches in information systems applications. Addresses the user interface and software design strategies, user experience levels, interaction styles, usability engineering, and collaborative systems technology. Students will perform formal software evaluations and usability tests.

CISC 690 Special Topics in Computer Science (3 credits)
This seminar focuses on the professor's current research interests. Requires consent of instructor and program director.

CISC 691 Project in Computer Science (3 credits)
Students pursue a project, research study, or implementation under the supervision of a faculty member.

Master of Science (M.S.) in Computing Technology in Education

This program offers a course of study leading to the master of science (M.S.) in computing technology in education. It is designed to meet the needs of working professionals such as teachers, educational administrators, and trainers working in either the public or the private sector. The program blends educational theory and practice into a learning experience that develops skills applicable to complex real-world problems. It enhances knowledge of how computers, software, and other forms of high technology can be used to improve learning outcomes. The program's online format offers full-time students the opportunity to earn the master's degree in 12 months and working professionals the opportunity to earn the degree in 18 months while remaining in their current positions.

Many of the courses in the program have been approved for teacher certification in computer science (grades K–12) or recertification by Florida's Bureau of Teacher Certification. They may be taken as part of the degree program or independently.

Program-Specific Admission Requirements (See pp. 17-18 for general admission requirements.)

This program is designed for students with earned bachelor's degrees from a regionally accredited institutions and extensive experience with computer applications, the Internet, and the World Wide Web.

Early Admission into the Doctoral Program

This option provides the opportunity to earn the Ph.D. or Ed.D. in computing technology in education in a shorter time. See detailed requirements in the section General Information on Master's Degree Programs.

The Curriculum for the M.S. in Computing Technology in Education

Core courses are listed below. If the thesis option is elected, two courses may be omitted. (Plans for the thesis option must be made with the program office.)

MCTE 615 The Internet
MCTE 625 Survey of Courseware
MCTE 628 Instructional Systems Design
MCTE 630 Database Systems
MCTE 645 Integrated Applications
MCTE 650 Computer Networks
MCTE 660 Multimedia and Emerging Technologies
MCTE 661 Instructional Delivery Systems
MCTE 670 Learning Theory and Computer Applications
MCTE 680 Human-Computer Interaction
MCTE 690 Research Methodology
MCTE 691 Master's Project in Computing Technology in Education

Course Descriptions for the M.S. in Computing Technology in Education

MCTE 615 The Internet (3 credits)
The Internet and other online information systems associated with the evolving information superhighway will soon have a dominant role in how information is organized and retrieved. This course emphasizes the development of effective online skills so that bibliographic, full-text, graphical, and numerical information can be accessed in an efficient manner. It also addresses skills and approaches required to teach the Internet.

MCTE 625 Survey of Courseware (3 credits)
State-of-the-art, content-rich courseware, across the grades, subjects, and platforms, will be explored and evaluated for educational value. Methods for integrating these programs into the curriculum will be discussed. Tutorials, drill and practice, instructional games, simulations, tests, and reference programs are included.

MCTE 628 Instructional Systems Design (3 credits)
This course develops practical instructional systems design competencies appropriate for the development of computer–assisted instruction applications. Students will experience both theory and best practices from the areas of education and training, as they develop and acquire instructional systems design skills and knowledge.

MCTE 630 Database Systems (3 credits)
This course covers fundamentals of database architecture, database management systems, and database systems. Principles and methodologies of database design, and techniques for database application development.

MCTE 645 Integrated Applications (3 credits)
This course provides experience with the multiple roles of electronic spreadsheets, databases, and graphs in teaching, learning, and the management of instruction. Using an integrated software package, these tools will be used to develop and reinforce skills in organizing, problem solving, generalizing, predicting, decision-making, and hypothesizing.

MCTE 650 Computer Networks (3 credits)
This course provides a framework for understanding computer network functionality, characteristics, and configurations. Topics include network topologies, protocols, and architectures; emerging trends in network technologies and services; and the role of ISDN (Integrated Services Digital Network) and ATM (Asynchronous Transfer Mode) in the educational environment. Strategies for network planning, implementation, management, and security are introduced. Recent advances in standardization, internetworking and deployment of LANs (local area networks), MANs (metropolitan area networks), and WANs (wide area networks) are examined.

MCTE 660 Multimedia and Emerging Technologies (3 credits)
Recent advances and future trends in learning technology and educational computing are examined. Innovations in teacher and student workstation technology are reviewed. Emphasis is placed on an examination of audio/video and computer-based tools currently in use in schools and training centers. Special attention is given to CD-ROM technology and laser disk technology. Guidelines for selection and implementation of multimedia projects are presented.

MCTE 661 Instructional Delivery Systems (3 credits)
An investigation of the expansion and applications of instructional delivery systems such as electronic delivery via telecommunications (email, electronic bulletin boards, conferencing systems), electronic classrooms or electronic whiteboards, audioconferencing, compressed video, World Wide Web (including HTML interfaces), group support systems, computer-aided instruction, broadcast via satellite, and multimedia. Comparative evaluation of instructional delivery systems.

MCTE 670 Learning Theory and Computer Applications (3 credits)
Students will explore learning theories and how learning is achieved when instruction is presented from a computer-based paradigm. The course will emphasize the computer as a learning device that can be used in an effective manner to model learning theories associated with behaviorism, cognitivism, and human information processing.

MCTE 680 Human-Computer Interaction (3 credits)
Explores the emerging field of human-computer interaction. Emphasis is placed on how software design practices are integrated with human factors principles and methods. Other issues covered include user experience levels, interaction styles, usability engineering, interaction devices and strategies, user-centered design, human information processing, social aspects of computing, and computer-supported cooperative work.

MCTE 690 Research Methodology (3 credits)
This course is an introduction to research, statistical analysis and decision-making. Close attention is paid to data types, data contributions, the identification of variables and descriptive data presentation techniques. Students are introduced to both parametric and non-parametric data analysis procedures including independent and dependent sample t-tests, chi-square analysis, and simple analysis of variance. Hypothesis testing and the use of statistical software packages are emphasized.

MCTE 691 Master's Project in Computing Technology in Education (3 credits)
This course is the capstone of the program. Each student will develop a comprehensive technology-based project using an environment of choice. Its purpose is to allow students the opportunity to further pursue topics or areas in which they have considerable interest. Each project will be closely mentored by faculty.

MCTE 695 Special Topics in Computing Technology in Education (3 credits)
This seminar focuses on the professor's current research interests. Requires consent of instructor and program director.

Master of Science (M.S.) in Management Information Systems

This program offers a course of study leading to the master of science (M.S.) in management information systems. It focuses on the application of information system concepts to the collection, retention, and dissemination of information for management planning and decision-making. The program blends theory and practice into a learning experience that develops skills applicable to complex real-world problems. Its formats offer full-time students the opportunity to earn the master's degree in 12 months and working professionals the opportunity to earn the degree in 18 months while remaining in their current positions.

Program-Specific Admission Requirements (See pp. 17-18 for general admission requirements.)

This program is designed for students with undergraduate majors in management information systems, computer information systems, business administration, or a related field, and having knowledge and significant experience in computer applications. Experience with the Internet is preferred. Students who cannot demonstrate competence in programming in a high-level language such as C, C++, Java, or COBOL are required to take MMIS 501, Introduction to Java Programming.

Early Admission into the Doctoral Program

This option provides the opportunity to earn the Ph.D. in information systems in a shorter time. See detailed requirements in the section General Information on Master's Degree Programs.

The Curriculum for the M.S. in Management Information Systems

Core courses and electives are listed below. The student may substitute up to two electives in lieu of two core courses. Students who wish to take an additional elective in lieu of a core course must request approval from the program office prior to registration. If the thesis option is elected, two courses may be omitted. (Plans for the thesis option must be made with the program office.) The student may request permission from the program office to register for MMIS 682, Project in Management Information Systems, to pursue a project under the supervision of a faculty member in lieu of a core course.

Core Courses:

MMIS 610 Survey of Computer Languages
MMIS 620 Management Information Systems
MMIS 621 Information Systems Project Management
MMIS 626 Client–Server and Distributed Computing
MMIS 630 Database Systems
MMIS 642 Data Warehousing
MMIS 653 Telecommunications and Computer Networking
MMIS 654 Electronic Commerce on the Internet
MMIS 660 Systems Analysis and Design
MMIS 661 Object-Oriented Applications
MMIS 671 Decision Support Systems
MMIS 680 Human-Computer Interaction

Electives:

MMIS 611 Computer Structures and Algorithms Using COBOL
MMIS 615 Quantitative Methods
MMIS 623 Legal and Ethical Aspects of Computing
MMIS 625 Computer Graphics
MMIS 631 Database Systems Project
MMIS 640 System Test and Evaluation
MMIS 652 Computer Security
MMIS 670 Artificial Intelligence and Expert Systems
MMIS 681 Multimedia Systems
MMIS 682 Project in Management Information Systems
MMIS 691 Special Topics in Management Information Systems
MMIS 699 Master's Thesis in Management Information Systems

Course Descriptions for the M.S. in Management Information Systems

MMIS 501 Introduction to Java Programming (3 credits)
This course is an introduction to the Java programming language. The course will include an introduction to the concepts of object-oriented programming and will show how Java supports this programming paradigm. You will learn about the Java environment and will write both applets (programs that execute in a Web browser) and applications (stand alone program). In addition to learning about basic language statements, you will also learn how Java provides support for such diverse applications as web pages, multimedia, educational, etc.

MMIS 610 Survey of Computer Languages (3 credits)
A study of high-level languages, fourth-generation languages, and command languages used in the development of software for management information systems. The logical and physical structure of programs and data. Concepts of structured programming. Data structures, file management, and their use in problem solving. Students will complete a variety of high-level language computer programs.

MMIS 611 Computer Structures and Algorithms Using COBOL (3 credits)
Data and file structure concepts, data record format and file organization, sequential vs. random file access methods, tree-based file structure and search techniques, indexing and data clustering, multiway sort/merge and sort algorithms, input/output blocking and buffering. The student will design and implement programs in COBOL.

MMIS 615 Quantitative Methods (3 credits)
An introduction to the basic quantitative tools needed to support problem solving and decision-making in the information systems environment. Heavy emphasis is placed on the application of these tools in a case-based, real world environment.

MMIS 620 Management Information Systems (3 credits)
The application of information system concepts to the collection, retention, and dissemination of information for management planning and decision-making. Issues such as personnel selection, budgeting, policy development, and organizational interfacing are discussed. Conceptual foundations and planning and development of management information systems. The role of MIS in an organization and the fit between the system and the organization.

MMIS 621 Information Systems Project Management (3 credits)
Practical examination of how projects can be managed from start to finish. Life-cycle models and paradigms. Life-cycle phases. Project planning and risk analysis. Project control including work breakdown structures, project scheduling, activities, and milestones. Software cost estimations techniques/models. Software quality assurance and metrics for software productivity and quality. Inspections, walkthroughs, and reviews. Approaches to team organization. Documentation and configuration management. Automated project management tools. Software maintenance. Procurement of software services and systems.

MMIS 623 Legal and Ethical Aspects of Computing (3 credits)
Focuses on issues that involve computer impact and related societal concerns. Topics include transitional data flow; copyright protection; information as a source of economic power; rights to access to computer systems; computer crime; data privacy; establishing national priorities in the technical and social aspects of computing; current and anticipated uses of computer prediction; and protection of personal ethical concerns. National computer policies of Japan, France, Great Britain, and the EEC, and the status of regulation and emerging standards.

MMIS 625 Computer Graphics (3 credits)
Presents computer graphics as an aid to information managers who need a clear means of presenting the analysis of information. Topics include basic graphic techniques (e.g. histograms, bar charts, pie charts), the theory of graphic presentation of information, desktop publishing software, presentation software, graphics monitors (EGA, CGA, VGA, RGB, composite), laser printers, computer screen projection systems, and standards.

MMIS 626 Client-Server and Distributed Computing (3 credits)
Included in this course are a wide range of issues, methods, techniques, and case examples for developing and managing client/server and distributed systems. These include client/server development using RAD methodologies, transaction process monitors, types of aboveware and middleware, middleware standards (DCE, RPC, and CORBA), managing client/server environments, software installation and distribution, electronic mail architectures in C/S systems, evaluation of vendor strategies, issues in selecting C/S products, legacy system migration issues, interoperability, scalability, network and security concerns, the emerging desktop standards, the role of network computers and thin clients, and the emergence of the WWW as an extension of the client/server environment.

MMIS 630 Database Systems (3 credits)
The application of database concepts to management information systems. Design objectives, methods, costs, and benefits associated with the use of a database management system. Tools and techniques for the management of large amounts of data. Database design, performance and administration. File organization and access methods. The architectures of database systems, data models for database systems (network, hierarchical, relational, and object oriented model), client/server database applications, distributed databases, and object-oriented databases.

MMIS 631 Database Systems Project (3 credits)
The techniques of database management systems will be applied to practical projects. Prerequisite: MMIS 630.

MMIS 640 System Test and Evaluation (3 credits)
An analysis of the verification and validation process. Methods, procedures, and techniques for integration and acceptance testing. Reliability measurement. Goals for testing. Testing in the small and testing in the large. Allocation of testing resources. When to stop testing. Test case design methods. Black box software testing techniques including equivalence partitioning, boundary-value analysis, cause-effect graphing, and error guessing. White box software testing techniques including statement coverage criterion, edge coverage criterion, condition coverage criterion, and path coverage criterion. Test of concurrent and real-time systems.

MMIS 642 Data Warehousing (3 credits)
This course includes the various factors involved in developing data warehouses and data marts: planning, design, implementation,and evaluation; review of vendor data warehouse products; cases involving contemporary implementations in business, government, and industry; techniques for maximizing effectiveness through OLAP and data mining.

MMIS 652 Computer Security (3 credits)
Concepts and principles of system and data security. Risks and vulnerabilities, policy formation, controls and protection methods, database security, encryption, authentication technologies, host-based and network-based security issues, personnel and physical security issues, issues of law and privacy. Discussions include firewall design and implementation, secure internet and intranet protocols, and techniques for responding to security breaches.

MMIS 653 Telecommunications and Computer Networking (3 credits)
This course provides a framework for understanding telecommunications fundamentals and computer network functionality, characteristics, and configurations. Topics include wirefree and wire-based communications; network topologies, protocols, and architectures; emerging trends in network technologies and services; and the role of ISDN (Integrated Services Digital Network) and ATM (Asynchronous Transfer Mode) in the corporate environment. Strategies for network planning, implementation, and management are introduced. Recent advances in standardization, internetworking, and deployment of LANs (local area networks), MANs (metropolitan area networks), and WANs (wide area networks) are examined.

MMIS 654 Electronic Commerce on the Internet (3 credits)
Electronic commerce has grown at an incredible rate, and experts forecast extraordinary growth over the near-term and long-term. It will be examined from three perspectives: (1) customer–business, (2) business–business, and (3) intra–organization. The Internet, intranets and extranets, electronic data interchange (EDI), security, electronic payment systems, tax issues, and global policy will be investigated. The student will participate in an Internet shopping experience and create or enhance a web page.

MMIS 660 Systems Analysis and Design (3 credits)
Analysis of requirements for information systems. Elicitation/fact-finding, problem analysis, decomposition, and the requirements document. Concepts, methods, techniques, and tools for systems analysis, modeling and simulation, and prototyping. Structured and object-oriented analysis. Role of the systems analyst in the organization. Gaining user commitment and fulfilling user needs. Concepts, tools, and techniques for systems design. Design principles, quality factors, decomposition of complex systems, and modularization techniques. Design methods such as object-oriented and function-oriented design. Comparison of analysis and design techniques.

MMIS 661 Object-Oriented Applications (3 credits)
Principles of the object-oriented paradigm. Application of object-oriented methods in management information systems. Object-oriented languages and design methods for class creation. Study of the use of object-oriented techniques in applications such as user interfaces, graphics, database systems, visual programming, hypermedia, office automation systems, and decision support systems. Techniques for software reuse.

MMIS 670 Artificial Intelligence and Expert Systems (3 credits)
This course will include an introduction to artificial intelligence as well as historical and current trends and characterization of knowledge-based systems. Search, logic and deduction, knowledge representation, production systems, and expert systems will be examined. Additional areas include architecture of expert systems and criteria for selecting expert system shells, such as end-user interface, developer interface, system interface, inference engine, knowledge base, and data interface. The student will use a commercial shell to build a working expert system.

MMIS 671 Decision Support Systems (3 credits)
Examines concepts of decision support in both non-automated and automated environments. Emphasis will be placed on structures, modeling, and the application of various decision support systems in today's corporate environment. Additional emphasis will be placed on the use of executive information and expert system applications. Case studies will be used to look at existent applications of each of these types of technology.

MMIS 680 Human-Computer Interaction (3 credits)
The dynamics of human-computer interaction (HCI). Provides a broad overview and offers specific background relating to user-centered design approaches in information systems applications. Areas to be addressed include the user interface and software design strategies, user experience levels, interaction styles, usability engineering, and collaborative systems technology. Students will perform formal software evaluations and usability tests.

MMIS 681 Multimedia Systems (3 credits)
Introduction to multimedia systems. Definition of terms and concepts related to multimedia. Trends in the development and use of multimedia. Tools, techniques, and guidelines facilitating the planning, design, production, management, implementation, and evaluation of multimedia products.

MMIS 682 Project in Management Information Systems (3 credits)
Students are assigned a project that involves part or all of the system development cycle and gain experience in analyzing, designing, implementing, and evaluating information systems. Prerequisite: prior consent of instructor.

MMIS 691 Special Topics in Management Information Systems (3 credits)
This seminar focuses on the professor's current research interests. Requires consent of instructor and program director.

Doctoral Degree Programs

General Information on Doctoral Degree Programs

Application for Admission

Admission decisions are made on a rolling basis. To ensure evaluation for the desired starting term, applications should be received at least two months prior to the start of that term. Unofficial copies of transcripts are acceptable for early review. Applicants may be granted *provisional admission* status pending completion of the application process (see p. 34). Late applications that cannot be processed in time for the desired starting term will be considered for the next available term. To obtain information or application forms contact:

The School of Computer and Information Sciences
Nova Southeastern University
P.O. Box 290600
Fort Lauderdale, FL 33329-0600

800-986-2247, ext. 2000 or (954) 262-2000
Email: scisinfo@scis.nova.edu
Web Site: www.scis.nova.edu

Applicants must meet the requirements and submit the documents specified below and **must also satisfy the program-specific admission requirements contained in the individual program sections of this catalog.** Detailed instructions for the preparation and mailing of admissions materials are contained in the school's Application for Admission packet.

a) An earned master's degree from a regionally accredited institution with an appropriate major (see program-specific admission requirements). Alternatively, SCIS master's students may apply for early admission into the doctoral program (see description in the section Early admission into the Doctoral Program, p. 34, and see specific options for early admission in sections on individual master's degree programs).

b) A completed application and application fee.

c) Official transcripts of all graduate and undergraduate work. A graduate GPA of at least 3.25.

d) Three letters of recommendation from individuals able to assess the applicant's intellectual ability, maturity, and motivation. Recommendations from friends, family members, or other individuals who are not able to evaluate the applicant on an academic or professional basis are unacceptable.

e) A comprehensive portfolio of relevant professional experience and credentials, or score report of the Graduate Record Examination (GRE).

f) Proficiency in the English language is a prerequisite for graduate study at the School of Computer and Information Sciences. Doctoral students are expected to write numerous papers and a dissertation. It is very important to note that grammatical errors, spelling errors, and writing that does not express ideas clearly will affect a student's grades and the completion of his or her degree. The faculty will not provide remedial help concerning grammatical errors or other writing problems. Applicants who are unable to write correctly and clearly are urged to seek remedial help before enrolling in any of the school's programs.

g) Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL). A minimum test score of 550 is required for applicants taking the written examination. A minimum test score of 213 is required for applicants taking the computer-based examination. (Scores must be no more than two years old.) Test results must be sent directly to the School of Computer and Information Sciences from TOEFL/TSE Services, P.O. Box 6153, Princeton, NJ, 08541-6153, USA; phone: (609) 771-7100; fax: (609) 771-7500, Web site: www.toefl.org.

h) Students on J-1 visas are required to secure an affidavit of support, from an agency or government who will be the financial sponsor, stating that they have a sufficient amount of money to support themselves for the duration of their study. Students on F-1 visas need an affidavit of support and a notarized/attested financial statement proving that they have a sufficient amount of money to support themselves for one academic year (generally nine months). The section Admission of International Students contains additional information regarding international student requirements.

Provisional or Conditional Admission

A degree-seeking applicant who has missing documents but appears to be acceptable based on documents received by SCIS may be offered *provisional admission.* Official admission will be granted upon receipt and acceptability of the remaining required documents. All missing documents must be submitted prior to the student's second registration. Examples of missing documents are an official transcript and a letter of recommendation. An applicant who has not met all admission requirements may be given *conditional admission* if sufficient evidence exists to suggest the ability to perform successfully in the program. A student with *conditional* status must remove stated deficiencies before applying for graduation.

Early Admission into the Doctoral Program

SCIS master's students may apply for early admission into a doctoral program (Ph.D. or Ed.D), which provides the student the opportunity to earn the doctorate in a shorter time. Requirements for early admission into the doctoral program are the completion of 24 credits in the master's program with a GPA of 3.25 or higher. Students must submit a doctoral application form to the SCIS Admissions Office along with a letter of intent and an updated curriculum vitae. Students may apply for early admission in the doctoral program during the term in which they will be completing 24 credits (8 courses) in the masters program. It is preferred that students apply early in the term to allow time for processing their application. If admitted into the doctoral program, the student may apply to the Master's Program Office for graduation and conferment of their master's degree after completing 12 credits in the doctoral program.

Additional Information on Admissions

Additional information on the admissions process is contained in the section General Information on SCIS Graduate Programs.

Orientation and Advisement

New doctoral students must attend an orientation day on the campus in Fort Lauderdale at their first cluster or institute meeting. The orientation includes introductions to the program office staff, computer requirements, online access, software tools that enhance the educational process, and library services. Students are offered dissertation counseling throughout the program. Advisement is conducted by the program office and the faculty.

Program Formats and Term Dates

Terms for the doctoral program are five months long. During the first two years of the program, the student completes two three-credit core courses and one four-credit project course each term. In the third year, the student registers for the dissertation at 12 credits per term. Students who have not completed the dissertation during registrations for Dissertation I and Dissertation II must register for Continuing Dissertation until they have satisfied the dissertation requirement. Doctoral residence is defined as continuous enrollment for two consecutive terms at a minimum of 10 credit hours per term.

Depending on the program, students may select one of two formats: *cluster* or *institute*. Computer information systems and computer science are offered in cluster format only. Computing technology in education, information science, and information systems are offered in both cluster and institute formats. Cluster students attend four cluster meetings per year, held quarterly over an extended weekend (Friday, Saturday, and half-day Sunday) at the university. Cluster terms start in March and September. Cluster weekends are held in March, June, September, and December. Institute students attend a weeklong institute twice a year at the university. Institutes are held in January and July at the start of each five-month term. **Students are required to attend all of their scheduled cluster or institute class sessions.** Clusters and institutes bring together students, faculty, and staff for participation in courses, workshops, and dissertation counseling. Between on-campus meetings, students work on assignments and projects, and participate in online activities that facilitate interaction with faculty, classmates, and colleagues.

The online component involves World Wide Web pages to access course materials, announcements, the electronic library, and other information, plus a range of online activities that facilitate frequent student–faculty and student–student interaction. These may include online forums using threaded bulletin boards, chatrooms, email, and electronic classroom sessions. In addition, the school provides a system that enables the student to submit assignments online in multimedia formats and to receive his or her professor's online reviews of assignments in the same multimedia formats. Students are provided NSU computer accounts but must obtain their own Internet service providers. Students may gain access to the university's computing resources from computer laboratories on the campus or from off–campus locations such as homes, offices, or elsewhere using either an IBM–compatible PC or an Apple Macintosh computer, and a modem. Students must comply with NSU policies on acceptable use of computing resources and use of material in Web pages (see pp. 58-60).

The Dissertation

The dissertation is the most important requirement for the doctoral degree. Each student is expected, with the approval of an advisor, to select an appropriate topic of sufficient scope to satisfy the requirements for the dissertation. Although registration for dissertation credits typically occurs at or near the end of completion of the course requirements, students are encouraged to learn about the dissertation process as early as possible and to begin talking with faculty about potential research topics early in the program. The dissertation must be an original work and must represent a significant extrapolation from a base of solid experience or knowledge in the student's area of concentration. Dissertation results must, in a significant way, advance knowledge, improve professional practice, or contribute to understanding in the field of study. Results must be of sufficient strength to distill from the work a paper worthy of publication in a journal or conference proceedings, or to use the work as the basis of a textbook or monograph. Although publication is not a requirement for completing the doctorate, students are encouraged to submit their dissertation research for publication. Doctoral students must follow the policies, procedures, and formatting requirements contained in the *SCIS Dissertation Guide.* Students may attend campus presentations on the dissertation process, research methodology, and writing for publication.

Evaluation of Dissertation Progress

Each student is evaluated on a number of occasions regarding his or her dissertation progress. The purpose of such evaluation is to provide students with relevant and timely feedback concerning their overall performance in the dissertation process and to serve as a screening procedure. Failure to demonstrate the ability to complete a dissertation or to maintain satisfactory progress on the dissertation may result in review by the Academic Review Committee and possible probation or dismissal from the doctoral program. Each student must demonstrate proficiency in the use of the English language in all work submitted during the dissertation process. Grammatical errors, spelling errors, and writing that does not express ideas clearly will not be tolerated and may result in the rejection of dissertation work. The faculty will not provide remedial help concerning grammatical errors or other writing problems that students might have. Students who are unable to write correctly and clearly are urged to contact their program office for sources of remedial help.

Research and Statistics Courses

The school offers several subject courses and companion project courses related to the research process: (1) Research Methodology; (2) Introduction to Statistics; and (3) Advanced Statistics. Students may be required by their dissertation advisors or by the Academic Review Committee to take one or more of these courses.

Grade Requirements and Time Limitations

Each student must maintain a cumulative grade point average of at least 3.0 for the duration of his or her program to remain in good academic standing (See the section Academic Standing on p. 12). Students are required to complete requirements for the doctorate within seven years from the date of their first registration.

Independent Study and Directed Independent Study

A student wishing to take an existing course or project on an independent study basis must first obtain written approval from the faculty member responsible for the course, and then forward his or her request to the program office for final approval. A student interested in conducting study, research, or creative activities under the supervision of a faculty member in areas not normally covered in any regular course may request permission from a faculty member and the program office to register for Directed Independent Study. A contract for independent study or directed independent study must be prepared by the student, include an assignment timeline, and be approved by the mentoring faculty member. With permission, Directed Independent Study may be repeated in a different area for credit. See the course description for Directed Independent Study for more information.

Cross-Registration

Cross-registration must be consistent with the student's doctoral degree program. Approval for cross-registration for courses offered outside the student's doctoral program must be obtained from the program office and the course instructor **prior to registration.**

Ph.D. Program in Computer Information Systems

This program offers a course of study leading to the degree of doctor of philosophy (Ph.D.) in computer information systems. It is offered in the cluster format which combines traditional and online instruction to provide professionals the opportunity to pursue graduate study while continuing to work in their current positions. The program is especially well suited to professionals in business, government, industry, or education who are involved with research, design, implementation, management, evaluation, utilization, or teaching of computer information systems. It provides technology-oriented professionals with the knowledge and ability to develop creative solutions to substantive real-world problems. Each student must complete eight courses, four projects, and a dissertation.

Program-Specific Admission Requirements (See pp. 33-34 for general admission requirements.)

This program is designed for the student with a master's degree in computer information systems, computer science, or a closely related field. The applicant should satisfy graduate prerequisites or have equivalent experience in information systems, programming languages, database systems, systems analysis and design, data communications and networks, and computer architecture. Alternatively, SCIS master's students may apply for early admission into the Ph.D. program (see the section General Information on Doctoral Degree Programs, and description of individual master's programs for details).

The Curriculum for the Ph.D. in Computer Information Systems

The program requires 64 credit hours of which 40 are required courses and projects and 24 are for the dissertation. Most students take two core courses and one project course per term during the first two years and register for the dissertation in the third year. Core courses, project courses, and dissertation registrations are listed below:

Core Courses (3 credits each) (Select eight of these)

DCIS	710	Decision Support Systems
DCIS	720	Human–Computer Interaction
DCIS	740	Data Communications and Computer Networking
DCIS	750	Database Systems
DCIS	760	Artificial Intelligence and Expert Systems
DCIS	770	Software Engineering
DCIS	780	Multimedia Systems
DCIS	790	Special Topics in Computer Information Systems
DCIS	791	Client–Server Computing

Project Courses (4 credits each) (Select four of these. Must be taken concurrent with or following completion of the corresponding core course.)

DCIS	810	Project in Decision Support Systems
DCIS	820	Project in Human–Computer Interaction
DCIS	840	Project in Data Communications and Computer Networking
DCIS	850	Project in Database Systems
DCIS	860	Project in Artificial Intelligence and Expert Systems
DCIS	870	Project in Software Engineering
DCIS	880	Project in Multimedia Systems
DCIS	890	Project in Special Topics in Computer Information Systems
DCIS	891	Project in Client–Server Computing

Dissertation Registrations

DCIS	910	Dissertation I (12 credits)
DCIS	915	Dissertation II (12 credits)
DCIS	920	Continuing Dissertation (6 credits)

Course Descriptions for the Ph.D. in Computer Information Systems

DCIS 710 Decision Support Systems (3 credits)
Principles and techniques relating to automated support for decision–making and organizational problem solving. Topics include decision theory, modeling and simulation, decision support system architecture, group decision support systems, knowledge-based expert systems, and intelligent systems.

DCIS 720 Human–Computer Interaction (3 credits)
Issues relating to effective human–computer interaction are presented. Basic elements, procedures, tools, and environments contributing to the development of successful user interfaces are explored. User interface design principles, guidelines, and methodologies are reviewed. Other topics include multidisciplinary dynamics of human– computer interaction as a field of study, current and projected developments in HCI research and usability engineering.

DCIS 740 Data Communications and Computer Networking (3 credits)
Recent advances and new applications in the expanding field of telecommunications and computer networks are examined. The technical fundamentals, architecture, and design of computer networks are described. Strategies, tools, and techniques for network planning, implementation, management, maintenance, and security are delineated. Topics include ISDN and ATM, the OSI Model, transmission media, network operating systems, topologies, configurations, protocols, and performance characteristics. Trends in standardization, internetworking, downsizing, and the development of local-area networks (LANs), wide-area networks (WANs), metropolitan-area networks (MANs), and enterprise-wide networks are explored.

DCIS 750 Database Systems (3 credits)
Theory and principles of databases and their management. Design, implementation, and traditional and nontraditional applications of database management systems. An emphasis will be placed on current issues, future directions, and research topics.

DCIS 760 Artificial Intelligence and Expert Systems (3 credits)
Theory of and major approaches to artificial intelligence. Topics include knowledge representation, heuristic search, artificial neural networks, machine learning, intelligent agents, and knowledge-based systems.

DCIS 770 Software Engineering (3 credits)
Covers advanced topics in the development of software–intensive systems, system life cycles, requirements definition and analysis, behavioral specification, design, implementation, verification and validation, system evolution, and project management. An emphasis will be placed on current issues, future directions, and research topics.

DCIS 780 Multimedia Systems (3 credits)
A course in advanced systems covering both theoretical and practical issues in designing multimedia systems. Topics to be covered include introduction to multimedia systems, compression techniques, synchronization, user interface issues, storage, video indexing and retrieval techniques, operating system support for digital audio and video, as well as network and transport protocols for multimedia. An emphasis will be placed on current design issues, research topics, software implementation, and discussion of future directions.

DCIS 790 Special Topics in Computer Information Systems (3 credits)
Covers advanced topics in areas of current research interest in computer information systems. May include topics such as client–server computing, distributed database systems, advanced computer graphics, object–oriented technology, the integration of networks and operating systems, and parallel computation. Topics will vary depending on student and faculty interest. Depending on interest, several special-topics courses may be offered concurrently. Since the content will vary, students may request permission to attend more than one special-topics course.

DCIS 791 Client–Server Computing (3 credits)
Students are expected to contribute to the expansion of the client–server (C/S) paradigm. Topics include the components of C/S architecture, security, networking aspects, interprocess communication (RPC), role of the GUI and front-end development tools (from screen scrapers to ICASE), middleware (2-tier and 3-tier), and back-end concerns. The role of standards in C/S development is discussed (including DCE, CORBA, ODBC, COM, and OLE) along with object–oriented aspects of C/S and distributed computing. Also included are the various relationships between client–server computing and business process reengineering, workflow automation, and groupware. Migration from legacy systems is considered along with concerns for meeting customer requirements (TQM, QFD, etc.).

DCIS 810 Project in Decision Support Systems (4 credits)
Students advance their knowledge through the completion of a research paper or project in the area of decision support systems. Some topics of current interest include model management, investigation of decision support aids, knowledge-based systems and intelligent systems, group DSS, and distributed DSS.

DCIS 820 Project in Human–Computer Interaction (4 credits)
Students produce a research paper or project on a current topic in HCI. Some topics of interest include interface quality and evaluation, computer system and computer interface architecture, Internet–based user interface design issues, legal and ethical aspects of computing, speech interfaces, and computer–supported cooperative work.

DCIS 840 Project in Data Communications and Computer Networking (4 credits)
Students pursue a research project, implementation, or simulation study on a current topic in data communications and/or computer networking. Some topics of current interest are client–server computing, internetworking, network management, ONC, DCE, DME, TCP/IP, OSI, and ISDN.

DCIS 850 Project in Database Systems (4 credits)
Students pursue a research study on a current topic in database systems or complete a database–oriented development project. Some areas of current interest include object–oriented database systems, extended relational DBMS, federated or heterogeneous database systems, high-performance parallel database systems, and advanced conceptual logic database modeling.

DCIS 860 Project in Artificial Intelligence and Expert Systems (4 credits)
Students pursue a research or development project in artificial intelligence. Some topics of current interest are artificial life, learning technologies (including symbol learning, neural networks, and genetic algorithms), intelligent agents, natural language processing, deep domain models in expert systems, vision, speech recognition, handwriting recognition, and parallel and distributed artificial intelligence.

DCIS 870 Project in Software Engineering (4 credits)
Students pursue a research project in a current topic in software engineering or complete a software engineering development project. Some topics of current interest include object–oriented analysis and design, software/system life cycles, reusability, specification, and verification.

DCIS 880 Project in Multimedia Systems (4 credits)
Students pursue a research study or project on a current topic in multimedia systems. Some areas of current interest include design and implementation of interactive multimedia applications including interactive television (e.g., video-on-demand, home shopping, voting, and games), hypermedia systems, digital signal processing, network architectures and protocols, multimedia authoring, videoconferencing, and groupware.

DCIS 890 Project in Special Topics in Computer Information Systems (4 credits)
Students pursue a research study, project, or implementation related to the Special Topics in Computer Information Systems course.

DCIS 891 Project in Client–Server Computing (4 credits)
The student must address and solve a significant problem that results in a final report of publishable quality.

DCIS 910 Dissertation I (12 credits)
The student develops a framework within which doctoral research will be conducted and offers evidence of qualifications to pursue the research. Prerequisite: Satisfactory completion of all coursework.

DCIS 915 Dissertation II (12 credits)
Concepts and theories underlying the student's doctoral research are articulated, the problem is clearly stated, specific, measurable goals are specified, a thorough literature review is presented, the methods of conducting the research are delineated, and a strategy to achieve the goal is given. Prerequisite: Dissertation I.

DCIS 920 Continuing Dissertation (6 credits)
Students who have not completed the dissertation by the end of Dissertation II must register for Continuing Dissertation each term in order to receive faculty and administrative advice and support related to the dissertation. Prerequisite: Completion of Dissertation II.

DCIS 1200 Directed Independent Study (3 credits or 4 credits)
Involves directed readings, research, and creative activities under the supervision of a faculty member. A contract for the independent study must be prepared by the student, include an assignment timeline, and be approved by the mentoring faculty member. With permission, Directed Independent Study may be repeated in a different area for credit. Directed Independent Study is not to be used as a substitute for an existing course. Prerequisite: Consent of the faculty member who will direct the independent study and approval by the program office prior to registration.
NOTE: In special situations, a student may be granted permission to take a regular numbered course on an independent-study basis. In such cases, the same conditions would apply but the course number would reflect the regular numbered course.

Ph.D. Program in Computer Science

This program offers a course of study leading to the degree of doctor of philosophy (Ph.D.) in computer science. It is offered in the cluster format which combines traditional and online instruction to provide professionals the opportunity to pursue graduate study while continuing to work in their current positions. The program is especially well suited to those in industry, education, or government who are involved with one of the many areas of computer science. It provides research–oriented professionals with knowledge in the major areas of computer science and the ability to develop creative solutions to substantive real-world problems. Each student must complete eight courses, four projects, and a dissertation.

Program-Specific Admission Requirements (See pp. 33-34 for general admission requirements.)

This program is designed for the student with a master's degree in computer science, or a closely related field. The applicant should satisfy graduate prerequisites or have equivalent experience in programming languages, data communications and computer networks, operating systems, compilers, database management systems, theory of computation, design and analysis of algorithms, and computer architecture. Alternatively, SCIS master's students may apply for early admission into the Ph.D. program (see the section General Information on Doctoral Degree Programs, and description of individual master's programs for details).

The Curriculum for the Ph.D. in Computer Science

The program requires 64 credit hours of which 40 are required courses and projects and 24 are for the dissertation. Most students take two core courses and one project course per term during the first two years and register for the dissertation in the third year. Core courses, project courses, and dissertation registrations are listed below:

Core Courses (3 credits each) (Select eight of these)

CISD	700	Theory and Principles of Programming
CISD	730	Operating Systems
CISD	740	Data Communications and Computer Networking
CISD	750	Database Management Systems
CISD	760	Artificial Intelligence
CISD	770	Software Engineering
CISD	790	Special Topics in Computer Science
CISD	792	Computer Graphics
CISD	793	Human–Computer Interaction
CISD	794	Knowledge Discovery in Databases

Project Courses (4 credits each) (Select four of these. Must be taken concurrent with or following completion of the corresponding core course.)

CISD	800	Project in Theory and Principles of Programming
CISD	830	Project in Operating Systems
CISD	840	Project in Data Communications and Computer Networking
CISD	850	Project in Database Management Systems
CISD	860	Project in Artificial Intelligence
CISD	870	Project in Software Engineering
CISD	890	Project in Special Topics in Computer Science
CISD	892	Project in Computer Graphics
CISD	893	Project in Human–Computer Interaction
CISD	894	Project in Knowledge Discovery in Databases

Dissertation Registrations

CISD	910	Dissertation I (12 credits)
CISD	915	Dissertation II (12 credits)
CISD	920	Continuing Dissertation (6 credits)

Course Descriptions for the Ph.D. in Computer Science

CISD 700 Theory and Principles of Programming (3 credits)
Covers advanced topics in areas of current research interest in programming languages, semantics, visual languages, and compiler design for contemporary systems and applications.

CISD 730 Operating Systems (3 credits)
Theory and practice of state-of-the-art methods in the structure and development of operating systems. Topics include operating system architectures, object-oriented operating systems, distributed operating systems, advanced human– computer interfaces such as speech and handwriting, and software engineering issues in the development of an operating system. An emphasis will be placed on current issues, future directions, and research topics.

CISD 740 Data Communications and Computer Networking (3 credits)
Study of data communications and network theory, design, and implementation. Topics include network architectures, transmission encoding, direct–link networks, switching, routing, network analysis, network algorithms, internetworking, addressing, name services, security, data compression, congestion control, and high speed networking. An emphasis will be placed on current issues, future directions, and research topics.

CISD 750 Database Management Systems (3 credits)
Theory and principles of databases and their management. Design, implementation, and traditional and nontraditional applications of database management systems.

CISD 760 Artificial Intelligence (3 credits)
Theory and practice of artificial intelligence and knowledge-based expert systems including issues in knowledge representation, search, heuristics, learning techniques, tools, languages and programming techniques. Current issues, future directions, and research topics will be explored.

CISD 770 Software Engineering (3 credits)
Covers advanced topics in areas of current research interest in the development of software-intensive systems, system life cycles, requirements definition and analysis, behavioral specification, design, implementation, verification and validation, system evolution, and project management. An emphasis will be placed on current issues, future directions, and research topics.

CISD 790 Special Topics in Computer Science (3 credits)
Covers advanced topics in areas of current research interest in computer science. May include topics in advanced computer architecture, artificial intelligence, distributed database management systems, advanced computer graphics, object–oriented technology, and parallel computation. Topics will vary depending on student and faculty interest. Depending on interest, several special-topics courses may be offered concurrently. Since the content will vary, students may request permission to attend more than one special-topics course.

CISD 792 Computer Graphics (3 credits)
This course will focus on algorithms and techniques that have emerged in the past several years. Topics include basic and advanced modeling and rendering methods, volume and scientific visualization techniques, visual programming languages and environments, and computer animation.

CISD 793 Human–Computer Interaction (3 credits)
This course stresses the importance of good interfaces and the relationship of user interface design to human– computer interaction. The central focus of this area is the efficient transfer of information between humans and machines. Other topics include the use and construction of user interfaces, UI design methodologies and strategies, graphics, evaluation of human-computer dialogues, and tradeoffs and consequences of interface design.

CISD 794 Knowledge Discovery in Databases (3 credits)
This course will study a number of emerging technical approaches to knowledge discovery in databases such as data clustering and summarization, algorithms for learning classification and characteristic rules, finding dependency networks, analyzing changes, detecting anomalies, and their applications. Current issues, future directions, and research topics will be explored.

CISD 800 Project in Theory and Principles of Programming (4 credits)
The mathematics of algorithms and the specification of design are the basis for the project to illustrate the benefits of structured models, quantitative documentation, and logical assertions for the interpretation and structure of computer programs. The projects include the use of modern languages to demonstrate the abstract structures necessary for application and system development.

CISD 830 Project in Operating Systems (4 credits)
Students pursue a research project or implementation on a current topic in operating systems. Implementation projects may involve constructing a portion of an operating system, simulating the behavior of key components, performance studies of existing systems, creation of a concurrent programming environment to model parallel hardware and software. Research papers may investigate current topics such as open systems, distributed systems, massive parallelism, object–oriented operating systems, and real-time operating systems.

CISD 840 Project in Data Communications and Computer Networking (4 credits)
A research report, design, implementation, or simulation is the focus of a student project. Topics of current interest include routing, security, internetworking, and network or transport layer protocol design.

CISD 850 Project in Database Management Systems (4 credits)
Students pursue a research study on a current topic in database systems or complete a database–oriented development project. Some areas of current interest include object–oriented database systems, extended relational DBMS, deductive and logic–based expert database systems, federated or heterogeneous database systems, other high-performance parallel database systems, and advanced conceptual logic database modeling.

CISD 860 Project in Artificial Intelligence (4 credits)
Students pursue a research or development project in artificial intelligence. Topics of current interest are artificial life, learning technologies (including symbol learning, neural networks, and genetic algorithms), intelligent agents, natural language processing, deep domain models in expert systems, vision, speech recognition, handwriting recognition, and parallel and distributed artificial intelligence.

CISD 870 Project in Software Engineering (4 credits)
Students pursue a research study in a current topic or complete a development project. Some topics of current interest include object–oriented analysis and design, software/system life cycles, reusability, specification, and verification.

CISD 890 Project in Special Topics in Computer Science (4 credits)
Students pursue a research study, project, or implementation related to the Special Topics in Computer Science course.

CISD 892 Project in Computer Graphics (4 credits)
Students pursue a research or implementation project on a current topic in computer graphics. Topics of interest include basic and advanced modeling and rendering methods, volume and scientific visualization techniques, visual programming languages and environments, computer animation, and virtual reality.

CISD 893 Project in Human–Computer Interaction (4 credits)
Students complete a research paper or project that investigates a current topic in HCI, such as HCI modeling, interface quality and evaluation, computer graphics, prototyping, computer system and interface architecture, interface toolkits, and groupware applications.

CISD 894 Project in Knowledge Discovery in Databases (4 credits)
Students pursue a research project or implementation on a current topic in knowledge discovery in databases. The research process for the project includes searching the literature, dissecting the existing methodologies for knowledge discovery in databases, and developing a new approach for knowledge discovery in databases.

CISD 910 Dissertation I (12 credits)
The student develops a framework within which doctoral research will be conducted and offers evidence of qualifications to pursue the research. Prerequisite: Satisfactory completion of all coursework.

CISD 915 Dissertation II (12 credits)
Concepts and theories underlying the student's doctoral research are articulated, the problem is clearly stated, specific, measurable goals are specified, a thorough literature review is presented, the methods of conducting the research are delineated, and a strategy to achieve the goal is given. Prerequisite: Dissertation I.

CISD 920 Continuing Dissertation (6 credits)
Students who have not completed the dissertation by the end of Dissertation II must register for Continuing Dissertation each term in order to receive faculty and administrative advice and support related to the dissertation. Prerequisite: Completion of Dissertation II.

CISD 1200 Directed Independent Study (3 credits or 4 credits)
Involves directed readings, research, and creative activities under the supervision of a faculty member. A contract for the independent study must be prepared by the student, include an assignment timeline, and be approved by the mentoring faculty member. With permission, Directed Independent Study may be repeated in a different area for credit. Directed Independent Study is not to be used as a substitute for an existing course. Prerequisite: Consent of the faculty member who will direct the independent study and approval by the program office prior to registration.
NOTE: In special situations, a student may be granted permission to take a regular numbered course on an independent-study basis. In such cases, the same conditions would apply but the course number would reflect the regular numbered course.

Ph.D./Ed.D. Program in Computing Technology in Education

This program offers a course of study leading to the degree of doctor of philosophy (Ph.D.) or doctor of education (Ed.D.) in computing technology in education. It is offered in both cluster and institute formats which combine traditional and online instruction to provide professionals the opportunity to pursue graduate study while continuing to work in their current positions. This program addresses: (1) the use of computing technologies to improve cognition; (2) the development, management, and evaluation of computing systems that support the educational process; and (3) the role of computing and other advanced technology in education and training. The program is especially well suited to educators, educational administrators, instructional system designers, and trainers. It provides technology–oriented professionals with the knowledge and ability to develop creative solutions to substantive real-world problems. Each student must complete eight courses, four projects, and a dissertation. A student may declare his or her degree preference (Ph.D. or Ed.D.) at any time during the program. The difference between these degrees is a name difference only. Most of the courses in the program have been approved for teacher certification in computer science (grades K–12) or recertification by Florida's Bureau of Teacher Certification. They may be taken as part of the degree program or independently.

Program-Specific Admission Requirements (See pp. 33-34 for general admission requirements.)

This program is designed for the student with a master's degree in education, training and learning, instructional design, information systems, educational leadership, or a closely related field. The candidate must have a significant amount of experience using computer applications and the Internet. Alternatively, SCIS master's students may apply for early admission into the Ph.D./Ed.D. program (see the section General Information on Doctoral Degree Programs, and description of individual master's programs for details).

The Curriculum for the Ph.D./Ed.D. in Computing Techonology in Education

The program requires 64 credit hours of which 40 are required courses and projects and 24 are for the dissertation. Most students take two core courses and one project course per term during the first two years and register for the dissertation in the third year. **Students are required to take the core course and project course in Research Methodology (DCTE 700/800. These must be taken concurrently).** Core courses, project courses, and dissertation registrations are listed below:

Core Courses (3 credits each) (Select eight of these)

DCTE	700	Research Methodology
DCTE	720	Human–Computer Interaction
DCTE	730	Seminar in Online Learning Environments
DCTE	740	Telecommunications and Computer Networks
DCTE	745	Multimedia Systems
DCTE	747	Learning Theory and Computer Applications
DCTE	750	Applied Database Systems
DCTE	770	Courseware Design and Development
DCTE	790	Special Topics in Computing Technology in Education

Project Courses (4 credits each) (Select four of these. Must be taken concurrent with or following completion of the corresponding core course.)

DCTE	800	Project in Research Methodology
DCTE	820	Project in Human–Computer Interaction
DCTE	830	Project in Online Learning Environments
DCTE	840	Project in Telecommunications and Computer Networks
DCTE	845	Project in Multimedia Systems
DCTE	847	Project in Learning Theory and Computer Applications
DCTE	850	Project in Applied Database Systems
DCTE	870	Project in Courseware Design and Development
DCTE	890	Project in Special Topics in Computing Technology in Education

Dissertation Registrations

DCTE	910	Dissertation I (12 credits)
DCTE	915	Dissertation II (12 credits)
DCTE	920	Continuing Dissertation (6 credits)

Course Descriptions for the Ph.D./Ed.D. in Computing Technology in Education

DCTE 700 Research Methodology (3 credits)
An in-depth treatment of the research process from an experimental, developmental, and evaluative perspective is provided. Techniques for planning and designing these types of projects as well as the methodologies for data collection, evaluation, and analysis are examined. Special emphasis is placed on the appropriate choice of methodologies for a variety of problem situations in both business and educational settings. Major emphasis is placed on the development of the proposal stage of research.

DCTE 720 Human–Computer Interaction (3 credits)
Techniques facilitating effective human–computer interaction are presented. Basic elements, procedures, tools, and environments contributing to the development of a successful user interface are explored. Design principles, guidelines, and methodologies for building, installing, managing, and maintaining interactive systems that optimize user productivity are reviewed. Topics include the multidisciplinary dynamics of human-computer interaction, current and projected developments in HCI research, computer-supported cooperative work, and strategies for implementing and evaluating human–computer dialogues.

DCTE 730 Seminar in Online Learning Environments (3 credits)
This course explores the emergence of online learning environments (OLEs) as viable alternatives or supplements to traditional classroom instruction. Students will investigate the theoretical, conceptual, instructional, and technical framework of implementing and using OLEs to support the learning paradigm. The basic technology and pedagogical implications of OLEs will be explored including, issues such as learning communities and learning technologies, the Internet and the Web, online electronic performance systems, asynchronous/synchronous communication tools, methods of instruction and online tools to support learning and instruction, design of OLEs, faculty and learner considerations, and evaluation of OLEs.

DCTE 740 Telecommunications and Computer Networks (3 credits)
Recent advances and new applications in the expanding field of telecommunications and computer networks are examined. The technical fundamentals, architecture, and design of computer networks are described. Strategies, tools, and techniques for network planning, implementation, management, maintenance, and security are delineated. Topics include ISDN, ATM, the OSI Model, transmission media, network operating systems, topologies, configurations, protocols, and performance characteristics. Trends in standardization, internetworking, and the development of local-area networks (LANs), metropolitan-area networks (MANs), wide-area networks (WANs), intranets, and extranets are examined.

DCTE 745 Multimedia Systems (3 credits)
A course in advanced systems covering both theoretical, practical, and applied issues in designing and evaluating multimedia systems. Tools, techniques, and guidelines facilitating the planning, design, production, and implementation of multimedia projects are delineated. Topics to be covered include introduction to multimedia systems, compression techniques, synchronization, user interface issues, storage, digital audio and video, as well as networking issues related to multimedia. Trends in the development and use of multimedia to support instruction, learning, and research are described.

DCTE 747 Learning Theory and Computer Applications (3 credits)
Computing technology is assuming an increasingly dominant role in instructional delivery. In this course, students explore learning theories and how learning is achieved when instruction is presented from a computer–based paradigm. The course examines the value of the computer as a learning device to model learning theories associated with behaviorism, cognitivism, and human information processing. An emphasis will be placed on current issues, future directions, and research topics.

DCTE 750 Applied Database Systems (3 credits)
Techniques for determining database requirements and managing organizational data resources are examined. Strategies for designing database management systems applications that satisfy specific requirements are presented. Components and architecture of the relational data model are analyzed. Methods for creating and implementing object–oriented information systems are explored. Topics include object–oriented languages, the user interface, databases and expert systems, distributed computing, and the advantages and drawbacks of commercially available DBMS tools and products.

DCTE 770 Courseware Design and Development (3 credits)
Explores the concepts and principles that underlie the design and development of courseware in education and training and implements the findings in the development of prototype materials. Students will become immersed in two important issues for successful functioning in the technological society of the 21st century: instructional design and team productions.

DCTE 790 Special Topics in Computing Technology in Education (3 credits)
Covers advanced topics in areas of current research interest in computing technology in education. May include topics in areas such as distance education, learning theory, adaptive devices, CD-ROM development, artificial intelligence and expert systems, adult literacy, computer graphics, and distributed database systems. Topics will vary depending on student and faculty interest. Depending on interest, several special-topics courses may be offered concurrently. Since the content will vary, students may request permission to take more than one special-topics course.

DCTE 800 Project in Research Methodology (4 credits)
This course will focus on the collection and analysis of data collected from experimental, developmental, and evaluative studies. Emphasis will be placed on the application of tools and techniques appropriate to the scenario and data type collected. The logical development of decisions based on the data analysis in terms of predefined hypotheses and/or project goals and objectives will be discussed. Major emphasis is placed on the development of the report stage of research.

DCTE 820 Project in Human–Computer Interaction (4 credits)
Students pursue a research study, project, or implementation in human–computer interaction.

DCTE 830 Project in Online Learning Environments (4 credits)
Students pursue a research study, project, or implementation in online learning environments.

DCTE 840 Project in Telecommunications and Computer Networks (4 credits)
Students pursue a research study, project, or implementation in telecommunications and computer networks.

DCTE 845 Project in Multimedia Systems (4 credits)
Students pursue a research study or project on a current topic in multimedia systems. Some areas of current interest include design and implementation of interactive multimedia applications including interactive television (e.g., video-on-demand, home shopping, voting, and games), hypermedia systems, digital signal processing, network architectures and protocols, multimedia authoring, videoconferencing, and groupware.

DCTE 847 Project in Learning Theory and Computer Applications (4 credits)
Students pursue a research study, project, or implementation in learning theory and computer applications.

DCTE 850 Project in Applied Database Systems (4 credits)
Students pursue a research study, project, or implementation in applied database management systems.

DCTE 870 Project in Courseware Design and Development (4 credits)
Requires the production of an entire courseware package. It is necessary to have a representative target population for purposes of beta testing the resulting product. The product should accommodate a range of learning styles. It must be submitted with development charts, a narrative explaining the roles taken at different times by team members, a review of the literature, and fully-functional, intuitively-used software. The inclusion of a management system is totally optional. However, the management component comes after the development and must not detract from software use. Additional teaching aids developed may be included.

DCTE 890 Project in Special Topics in Computing Technology in Education (4 credits)
Students pursue a research study, project, or implementation on special topics in computing technology in education.

DCTE 910 Dissertation I (12 credits)
The student develops a framework within which doctoral research will be conducted and offers evidence of qualifications to pursue the research. Prerequisite: Satisfactory completion of all coursework.

DCTE 915 Dissertation II (12 credits)
Concepts and theories underlying the student's doctoral research are articulated, the problem is clearly stated, specific, measurable goals are specified, a thorough literature review is presented, the methods of conducting the research are delineated, and a strategy to achieve the goal is given. Prerequisite: Dissertation I.

DCTE 920 Continuing Dissertation (6 credits)
Students who have not completed the dissertation by the end of Dissertation II must register for Continuing Dissertation each term in order to receive faculty and administrative advice and support related to the dissertation. Prerequisite: Completion of Dissertation II.

DCTE 1200 Directed Independent Study (3 credits or 4 credits)
Involves directed readings, research, and creative activities under the supervision of a faculty member. A contract for the independent study must be prepared by the student, include an assignment timeline, and be approved by the mentoring faculty member. With permission, Directed Independent Study may be repeated in a different area for credit. Directed Independent Study is not to be used as a substitute for an existing course. Prerequisite: Consent of the faculty member who will direct the independent study and approval by the program office prior to registration.
NOTE: In special situations, a student may be granted permission to take a regular numbered course on an independent-study basis. In such cases, the same conditions would apply but the course number would reflect the regular numbered course.

Ph.D. Program in Information Science

This program offers a course of study leading to the degree of doctor of philosophy (Ph.D.) in information science. It is offered in both cluster and institute formats which combine traditional and online instruction to provide professionals the opportunity to pursue graduate study while continuing to work in their current positions. The program focuses on information organization and retrieval which have evolved into issues of enormous importance in light of the continued rapid developments in computing technology. The program is especially well suited to professionals working in a library or information center environment in education, business, government, or industry. It provides research- and technology–oriented professionals the knowledge and ability to develop creative solutions to substantive real-world problems in information science. Each student must complete eight courses, four projects, and a dissertation.

Program-Specific Admission Requirements (See pp. 33-34 for general admission requirements.)

This program is designed for the student with a master's degree in information systems, information science, library science, computer education, or a closely related area. The candidate must have a significant amount of experience using computer applications and the Internet. Alternatively, SCIS master's students may apply for early admission into the Ph.D. program (see the section General Information on Doctoral Degree Programs, and description of individual master's programs for details).

The Curriculum for the Ph.D. in Information Science

The program requires 64 credit hours of which 40 are required courses and projects and 24 are for the dissertation. Most students take two core courses and one project course per term during the first two years and register for the dissertation in the third year. Core courses, project courses, and dissertation registrations are listed below:

Core Courses (3 credits each) (DISC 725 and 735 are required. Select six others.)

DISC	725	Structure of Library Information Systems
DISC	735	Organization of Information
DISC	790	Special Topics in Information Science
DCTE	700	Research Methodology (if 700 is elected, DCTE 800 must be taken concurrently)
DCTE	720	Human–Computer Interaction
DCTE	730	Seminar in Online Learning Environments
DCTE	740	Telecommunications and Computer Networks
DCTE	745	Multimedia Systems
DCTE	747	Learning Theory and Computer Applications
DCTE	750	Applied Database Systems

Project Courses (4 credits each) (Select four of these. Must be taken concurrent with or following completion of the corresponding core course.)

DISC	825	Project in Structure of Library Information Systems
DISC	835	Project in Organization of Information
DISC	890	Project in Special Topics in Information Science
DCTE	800	Project in Research Methodology (must be taken concurrent with DCTE 700)
DCTE	820	Project in Human–Computer Interaction
DCTE	830	Project in Online Learning Environments
DCTE	840	Project in Telecommunications and Computer Networks
DCTE	845	Project in Multimedia Systems
DCTE	847	Project in Learning Theory and Computer Applications
DCTE	850	Project in Applied Database Systems

Dissertation Registrations

DISC	910	Dissertation I (12 credits)
DISC	915	Dissertation II (12 credits)
DISC	920	Continuing Dissertation (6 credits)

Course Descriptions for the Ph.D. in Information Science

DISC 725 Structure of Library Information Systems (3 credits)
The evolution, design, and structure of online information systems are examined. Principles, concepts, and techniques for online information retrieval are described. Topics include the methodology of the search process, bibliometrics, the Internet, the user interface, hypertext and hypermedia, CD-ROM and related technologies, and standardization. Case studies highlighting the planning, implementation, and management of online information systems are discussed. Trends in system enhancements, the use of remote online services for information retrieval, electronic document delivery, electronic publishing, and end-user training are reviewed. Problems and issues associated with electronic information access and delivery are noted.

DISC 735 Organization of Information (3 credits)
Techniques for information acquisition, organization, management, and dissemination in an integrated electronic networked environment are presented. Guidelines for the implementation of innovative information technologies to expedite research and instruction are examined. Approaches for using the Internet to facilitate the provision of library services are delineated.

DISC 790 Special Topics in Information Science (3 credits)
Covers advanced topics in areas of current research interest in information science. May include topics such as the virtual library, network security, the emerging national information infrastructure (NII), Internet issues, and design/implementation of information system services and applications. Topics will vary depending on student and faculty interest. Depending on interest, several special-topics courses may be offered concurrently. Since the content will vary, students may request permission to attend more than one special-topics course.

DCTE 700 Research Methodology (3 credits)
An in-depth treatment of the research process from an experimental, developmental, and evaluative perspective is provided. Techniques for planning and designing these types of projects as well as the methodologies for data collection, evaluation, and analysis are examined. Special emphasis is placed on the appropriate choice of methodologies for a variety of problem situations in both business and educational settings. Major emphasis is placed on the development of the proposal stage of research.

DCTE 720 Human–Computer Interaction (3 credits)
Techniques facilitating effective human–computer interaction are presented. Basic elements, procedures, tools, and environments contributing to the development of a successful user interface are explored. Design principles, guidelines, and methodologies for building, installing, managing, and maintaining interactive systems that optimize user productivity are reviewed. Topics include the multidisciplinary dynamics of human-computer interaction, current and projected developments in HCI research, computer-supported cooperative work, and strategies for implementing and evaluating human–computer dialogues.

DCTE 730 Seminar in Online Learning Environments (3 credits)
This course explores the emergence of online learning environments (OLEs) as viable alternatives or supplements to traditional classroom instruction. Students will investigate the theoretical, conceptual, instructional, and technical framework of implementing and using OLEs to support the learning paradigm. The basic technology and pedagogical implications of OLEs will be explored including, issues such as learning communities and learning technologies, the Internet and the Web, online electronic performance systems, asynchronous/synchronous communication tools, methods of instruction and online tools to support learning and instruction, design of OLEs, faculty and learner considerations, and evaluation of OLEs.

DCTE 740 Telecommunications and Computer Networks (3 credits)
Recent advances and new applications in the expanding field of telecommunications and computer networks are examined. The technical fundamentals, architecture, and design of computer networks are described. Strategies, tools, and techniques for network planning, implementation, management, maintenance, and security are delineated. Topics include ISDN, ATM, the OSI Model, transmission media, network operating systems, topologies, configurations, protocols, and performance characteristics. Trends in standardization, internetworking, and the development of local-area networks (LANs), metropolitan-area networks (MANs), wide-area networks (WANs), intranets, and extranets are examined.

DCTE 745 Multimedia Systems (3 credits)
A course in advanced systems covering both theoretical, practical, and applied issues in designing and evaluating multimedia systems. Tools, techniques, and guidelines facilitating the planning, design, production, and implementation of multimedia projects are delineated. Topics to be covered include introduction to multimedia systems, compression techniques, synchronization, user interface issues, storage, digital audio and video, as well as networking issues related to multimedia. Trends in the development and use of multimedia to support instruction, learning, and research are described.

DCTE 747 Learning Theory and Computer Applications (3 credits)
Computing technology is assuming an increasingly dominant role in instructional delivery. In this course, students explore learning theories and how learning is achieved when instruction is presented from a computer–based paradigm. The course examines the value of the computer as a learning device to model learning theories associated with behaviorism, cognitivism, and human information processing. An emphasis will be placed on current issues, future directions, and research topics.

DCTE 750 Applied Database Systems (3 credits)
Techniques for determining database requirements and managing organizational data resources are examined. Strategies for designing database management systems applications that satisfy specific requirements are presented. Components and architecture of the relational data model are analyzed. Methods for creating and implementing object–oriented information systems are explored. Topics include object–oriented languages, the user interface, databases and expert systems, distributed computing, and the advantages and drawbacks of commercially available DBMS tools and products.

DISC 825 Project in Structure of Library Information Systems (4 credits)
Students pursue a research study, project, or implementation in library information systems.

DISC 835 Project in Organization of Information (4 credits)
Students pursue a research study, project, or implementation in organization of information.

DISC 890 Project in Special Topics in Information Science (4 credits)
Students pursue a research study, project, or implementation in special topics in information science.

DCTE 800 Project in Research Methodology (4 credits)
This course will focus on the collection and analysis of data collected from experimental, developmental, and evaluative studies. Emphasis will be placed on the application of tools and techniques appropriate to the scenario and data type collected. The logical development of decisions based on the data analysis in terms of predefined hypotheses and/or project goals and objectives will be discussed. Major emphasis is placed on the development of the report stage of research.

DCTE 820 Project in Human–Computer Interaction (4 credits)
Students pursue a research study, project, or implementation in human–computer interaction.

DCTE 830 Project in Online Learning Environments (4 credits)
Students pursue a research study, project, or implementation in online learning environments.

DCTE 840 Project in Telecommunications and Computer Networks (4 credits)
Students pursue a research study, project, or implementation in telecommunications and computer networks.

DCTE 845 Project in Multimedia Systems (4 credits)
Students pursue a research study or project on a current topic in multimedia systems. Some areas of current interest include design and implementation of interactive multimedia applications including interactive television (e.g., video-on-demand, home shopping, voting, and games), hypermedia systems, digital signal processing, network architectures and protocols, multimedia authoring, videoconferencing, and groupware.

DCTE 847 Project in Learning Theory and Computer Applications (4 credits)
Students pursue a research study, project, or implementation in learning theory and computer applications.

DCTE 850 Project in Applied Database Systems (4 credits)
Students pursue a research study, project, or implementation in applied database management systems.

DISC 910 Dissertation I (12 credits)
The student develops a framework within which doctoral research will be conducted and offers evidence of qualifications to pursue the research. Prerequisite: Satisfactory completion of all coursework.

DISC 915 Dissertation II (12 credits)
Concepts and theories underlying the student's doctoral research are articulated, the problem is clearly stated, specific, measurable goals are specified, a thorough literature review is presented, the methods of conducting the research are delineated, and a strategy to achieve the goal is given. Prerequisite: Dissertation I.

DISC 920 Continuing Dissertation (6 credits)
Students who have not completed the dissertation by the end of Dissertation II must register for Continuing Dissertation each term in order to receive faculty and administrative advice and support related to the dissertation. Prerequisite: Completion of Dissertation II.

DISC 1200 Directed Independent Study (3 credits or 4 credits)
Involves directed readings, research, and creative activities under the supervision of a faculty member. A contract for the independent study must be prepared by the student, include an assignment timeline, and be approved by the mentoring faculty member. With permission, Directed Independent Study may be repeated in a different area for credit. Directed Independent Study is not to be used as a substitute for an existing course. Prerequisite: Consent of the faculty member who will direct the independent study and approval by the program office prior to registration.
NOTE: In special situations, a student may be granted permission to take a regular numbered course on an independent-study basis. In such cases, the same conditions would apply but the course number would reflect the regular numbered course.

Ph.D. Program in Information Systems

This program offers a course of study leading to the degree of doctor of philosophy (Ph.D.) in information systems. It is offered in both cluster and institute formats which combine traditional and online instruction to provide professionals the opportunity to pursue graduate study while continuing to work in their current positions. The program is especially well suited to professionals working in areas such as information system planning, systems analysis and design, project management, information system administration, or software engineering. It provides technology–oriented professionals with the knowledge and ability to develop creative solutions to substantive real-world problems in information systems. Each student must complete eight courses, four projects, and a dissertation.

Program-Specific Admission Requirements (See pp. 33-34 for general admission requirements.)

This program is designed for the student with a master's degree in information systems, information science, computer science, or a related area. The applicant should satisfy graduate prerequisites or have equivalent experience in information systems, programming languages, database systems, systems analysis and design, data communications and networks, and computer architecture. Alternatively, SCIS master's students may apply for early admission into the Ph.D. program (see the section General Information on Doctoral Degree Programs, and description of individual master's programs for details).

The Curriculum for the Ph.D. in Information Systems

The program requires 64 credit hours of which 40 are required courses and projects and 24 are for the dissertation. Most students take two core courses and one project course per term during the first two years and register for the dissertation in the third year. Core courses, project courses, and dissertation registrations are listed below:

Core Courses (3 credits each) (All eight core courses must be taken.)

DISS	710	Decision Support Systems
DISS	720	Human–Computer Interaction
DISS	725	The System Development Process
DISS	740	Telecommunications and Computer Networks
DISS	750	Database Systems
DISS	780	Multimedia Systems
DISS	790	Special Topics in Information Systems
DISS	791	Client–Server Computing

Project Courses (4 credits each) (Select four of these. Must be taken concurrent with or following completion of the corresponding core course.)

DISS	810	Project in Decision Support Systems
DISS	820	Project in Human–Computer Interaction
DISS	825	Project in The System Development Process
DISS	840	Project in Telecommunications and Computer Networks
DISS	850	Project in Database Systems
DISS	880	Project in Multimedia Systems
DISS	890	Project in Special Topics in Information Systems
DISS	891	Project in Client–Server Computing

Dissertation Registrations

DISS	910	Dissertation I (12 credits)
DISS	915	Dissertation II (12 credits)
DISS	920	Continuing Dissertation (6 credits)

Course Descriptions for the Ph.D. in Information Systems

DISS 710 Decision Support Systems (3 credits)
Structure, functions, capabilities, and limitations of decision support systems (DSS) are discussed. Development tools and techniques for constructing DSS are investigated. The focus is on automatic support for decision making and organizational problem solving. Topics include decision theory, modeling and simulation, decision support system architecture, group decision support systems, knowledge-based expert systems, and intelligent systems.

DISS 720 Human–Computer Interaction (3 credits)
Issues relating to effective human–computer interaction are presented. Basic elements, procedures, tools, and environments contributing to the development of successful user interfaces are explored. User interface design principles, guidelines, and methodologies are reviewed. Other topics include the multidisciplinary dynamics of human– computer interaction as a field of study, current and projected developments in HCI research and usability engineering

DISS 725 The System Development Process (3 credits)
System life-cycle models, application development strategies, and feasibility assessment. Techniques, methods, and tools for the analysis and specification of information systems. Design principles including abstraction, modularity, encapsulation, information hiding, and reusability. Quality factors. Contemporary design methods and tools including object–oriented design and function–oriented design. Study of the verification and validation process. Integration and acceptance testing. Reliability measurement. Software testing techniques. Test of concurrent and real-time systems. Techniques for managing hardware, software, communications, distributed applications, multimedia systems, and end user computing. Approaches to project planning, managing change and innovation, and facilitating computer and communications security.

DISS 740 Telecommunications and Computer Networks (3 credits)
Recent advances and new applications in the expanding field of telecommunications and computer networks are examined. The technical fundamentals, architecture, and design of computer networks are described. Strategies, tools, and techniques for network planning, implementation, management, maintenance, and security are delineated. Topics include ISDN, ATM, the OSI Model, transmission media, network operating systems, topologies, configurations, protocols, and performance characteristics. Trends in standardization, internetworking, and the development of local-area networks (LANs), metropolitan-area networks (MANs), wide-area networks (WANs), intranets, and extranets are examined.

DISS 750 Database Systems (3 credits)
Theory and principles of databases and their management. Design, implementation, and traditional and nontraditional applications of database management systems. An emphasis will be placed on current issues, future directions, and research topics.

DISS 780 Multimedia Systems (3 credits)
A course in advanced systems covering both theoretical and practical issues in designing multimedia systems. Topics to be covered include introduction to multimedia systems, compression techniques, synchronization, user interface issues, storage, video indexing and retrieval techniques, operating system support for digital audio and video, as well as network and transport protocols for multimedia. An emphasis will be placed on current design issues, research topics, software implementation and discussion of future directions.

DISS 790 Special Topics in Information Systems (3 credits)
Covers advanced topics in areas of current research interest in information systems. May include topics such as client–server computing, distributed database systems, advanced computer graphics, object–oriented technology, the integration of networks and operating systems, ATM–based networks (asynchronous transfer mode), computer and network security, and parallel computation. Topics will vary depending on student and faculty interest. Depending on interest, several special-topics courses may be offered concurrently. Since the content will vary, students may request permission to attend more than one special-topics course.

DISS 791 Client–Server Computing (3 credits)
Students are expected to contribute to the expansion of the Client–Server (C/S) paradigm. Topics include the components of C/S architecture, security, networking aspects, interprocess communication (RPC), role of the GUI and front-end development tools (from screen scrapers to ICASE), middleware (2-tier and 3-tier) and back-end concerns. The role of standards in C/S development is discussed including (DCE, CORBA, ODBC, COM, and OLE) along with object–oriented aspects of C/S and distributed computing. Also included are the various relationships between client–server computing and business process reengineering, workflow automation, and groupware. Migration from legacy systems is considered along with concerns for meeting customer requirements (TQM, QFD, etc.).

DISS 810 Project in Decision Support Systems (4 credits)
Students advance their knowledge through the completion of a research paper or project in the area of decision support systems. Some topics of current interest include comparisons of decision support aids, the relationship between decision support systems and expert systems, DSS hardware and software, group DSS, distributed DSS and data communications, and human problem solving through DSS.

DISS 820 Project in Human–Computer Interaction (4 credits)
Students produce a research paper or project on a current topic in HCI. Some topics of interest include interface quality and evaluation, computer system and computer interface architecture, Internet–based user interface design issues, legal and ethical aspects of computing, speech interfaces, and computer–supported cooperative work.

DISS 825 Project in The System Development Process (4 credits)
Students pursue a research study, project, or implementation in the system development process.

DISS 840 Project in Telecommunications and Computer Networks (4 credits)
Students pursue a research study, project, or implementation in computer networks and telecommunications.

DISS 850 Project in Database Systems (4 credits)
Students pursue a research study on a current topic in database systems or complete a database–oriented development project. Some areas of current interest include object–oriented database systems, extended relational DBMS, federated or heterogeneous database systems, high-performance parallel database systems, and advanced conceptual logic database modeling.

DISS 880 Project in Multimedia Systems (4 credits)
Students pursue a research study or project on a current topic in multimedia systems. Some areas of current interest include design and implementation of interactive multimedia applications including interactive television (e.g., video-on-demand, home shopping, voting, and games), hypermedia systems, digital signal processing, network architectures and protocols, multimedia authoring, and video conferencing and groupware.

DISS 890 Project in Special Topics in Information Systems (4 credits)
Students pursue a research study, project, or implementation in special topics in information systems.

DISS 891 Project in Client–Server Computing (4 credits)
The student must address and solve a significant problem that results in a final report of publishable quality.

DISS 910 Dissertation I (12 credits)
The student develops a framework within which doctoral research will be conducted and offers evidence of qualifications to pursue the research. Prerequisite: Satisfactory completion of all coursework.

DISS 915 Dissertation II (12 credits)
Concepts and theories underlying the student's doctoral research are articulated, the problem is clearly stated, specific, measurable goals are specified, a thorough literature review is presented, the methods of conducting the research are delineated, and a strategy to achieve the goal is given. Prerequisite: Dissertation I.

DISS 920 Continuing Dissertation (6 credits)
Students who have not completed the dissertation by the end of Dissertation II must register for Continuing Dissertation each term in order to receive faculty and administrative advice and support related to the dissertation. Prerequisite: Completion of Dissertation II.

DISS 1200 Directed Independent Study (3 credits or 4 credits)
Involves directed readings, research, and creative activities under the supervision of a faculty member. A contract for the independent study must be prepared by the student, include an assignment timeline, and be approved by the mentoring faculty member. With permission, Directed Independent Study may be repeated in a different area for credit. Directed Independent Study is not to be used as a substitute for an existing course. Prerequisite: Consent of the faculty member who will direct the independent study and approval by the program office prior to registration.
NOTE: In special situations, a student may be granted permission to take a regular numbered course on an independent-study basis. In such cases, the same conditions would apply but the course number would reflect the regular numbered course.

Faculty and Staff of The School of Computer and Information Sciences

The Faculty

Gertrude W. Abramson, Ed.D., Columbia University. Professor. Computer–supported education, hypermedia/ multimedia, instructional systems design and development, distance learning, instruction delivery systems.

Maxine S. Cohen, Ph.D., State University of New York at Binghamton. Associate Professor. Human–computer interaction, multimedia, usability engineering, , database systems, distance education.

Laurie P. Dringus, Ph.D., Nova Southeastern University. Associate Professor. Human–computer interaction, group support systems, usability engineering, learning theory, distance learning.

Timothy J. Ellis, Ph.D., Nova Southeastern University. Assistant Professor. Multimedia, distance education, the Internet as a tool for education and commerce, adult education, networks and electronic communication.

George K. Fornshell, Ph.D., Nova Southeastern University. Associate Professor. Instructional systems development, multimedia, authoring systems, human factors, distance education.

William L. Hafner, M.S.E.E., University of Pennsylvania. Lecturer. Human-computer interaction, data warehousing, information storage and retrieval, computer security, artificial intelligence.

William M. Hartman, Ph.D., Nova Southeastern University. Lecturer. Software engineering, data communications, computer networks, decision support systems, mathematics in computing.

Michael J. Laszlo, Ph.D., Princeton University. Associate Professor. Data structures and algorithms, software engineering, programming, computer graphics.

Jacques Levin, Ph.D., University of Grenoble. Professor. Database management, modeling, distance education, decision support systems, numerical analysis.

Edward Lieblein, Ph.D., University of Pennsylvania. Professor and Dean. Software engineering, object-oriented design, programming languages, automata theory.

Marlyn Kemper Littman, Ph.D., Nova Southeastern University. Professor. Computer networks, ATM, wirefree and wire-based communications, network security, distance learning.

Frank Mitropoulos, M.S., Nova Southeastern University. Instructor. Programming languages, data structures, software engineering, object–oriented design, C, C++.

Sumitra Mukherjee, Ph.D., Carnegie Mellon University. Associate Professor. Database, decision support systems, information systems, network security, artificial intelligence, telecommunications.

John Scigliano, Ed.D., University of Florida. Professor. Online information systems, information systems management, distance education.

Greg Simco, Ph.D., Nova Southeastern University. Assistant Professor. Operating systems, data communications, computer networks, client-server computing, online learning environments, C++, Java.

Junping Sun, Ph.D., Wayne State University. Associate Professor. Database management systems, object–oriented database systems, artificial neural networks.

Raisa Szabo, M.S., Budapest Technical Institute. Instructor. Computer architecture, artificial intelligence, neural networks, robotics, operations research, concurrent languages.

Steven R. Terrell, Ed.D., Florida International University. Associate Professor. Research methodology and statistics, learning theory, distance education, computer-managed instruction.

Visiting and Adjunct Faculty

Anne Abate, Ph.D.	Rollins Guild, Ph.D.	Richard Manning, Ph.D.	David Metcalf II, Ph.D.
Susan Dorchak, Ph.D.	Lee Leitner, Ph.D.	Ronald McFarland, Ph.D.	Elena Schultz, M.S.
Andres Folleco, Ph.D.	Robert Lipton, Ph.D.	Terry McQueen, D.B.A.	Steven Zink, Ph.D.

Teaching Assistants

Mohamad Foustok, M.S.	Jueen Lee, M.S.	Takaaki Tomizawa, M.S.

The Administrative and Technical Staff

Roberta Arnold, Director, Undergraduate Programs.

Bonnie Bowers, Operations Manager and Assistant to the Dean.

Phyllis Boyd, Advisor, Undergraduate Programs.

Sharon Brown, Admissions Representative.

Sonya Brown, Receptionist.

Claudia Chong, Assistant to the Director, Finance and Administration.

Crystal Darville, Coordinator, Doctoral Programs.

Kimberley Driscoll, Advisor, Master's Programs.

Barbara J. Edge, Director, Finance and Administration.

Sunnie Ewing, Admissions Representative.

Banesha Fenster-Schneid, Coordinator, Faculty Support.

Diane King, Director, Doctoral Programs.

Cynthia Jackson, Assistant to the Director, Master's Programs.

Andre Lee-Fook, Administrative Secretary, Admissions.

Elizabeth Koenig, Advisor, Master's Programs.

Edward Lieblein, Dean.

Kristen Oldberg, Clerical Assistant, Doctoral Programs.

Toni Phillips, Coordinator, Doctoral Programs.

Mark Powell, Coordinator, Network and Software Services.

Kevin Richardson, Coordinator, Network and Software Services.

Bellarmin Selvaraj, Director, Master's Programs.

Karen Shoemaker, Administrative Assistant, Admissions.

Clare Singer, Coordinator, Admissions.

Irene Stringer, Coordinator, Marketing.

Christopher Thomas, Coordinator, Network and Software Services.

Elizabeth Vayda, Coordinator, Finance and Administration.

Elvira Veloso, Administrative Secretary, Doctoral Programs.

Ramona Woods, Coordinator, Finance and Administration.

Provisions

The provisions set forth in this document are not to be regarded as an irrevocable contract between the student and Nova Southeastern University. Regulations and requirements, including tuition and fees, are necessarily subject to change without notice at any time at the discretion of the administration. The university further reserves the right to require a student to withdraw at any time, as well as the right to impose probation on any student whose conduct is unsatisfactory. Any admission on the basis of false statements or documents is void upon discovery of the fraud, and the student is not entitled to any credit for work that he or she may have done at the university. Upon dismissal or suspension from the university for cause, there will be no refund of tuition and fees. The balance due Nova Southeastern University will be considered receivable and will be collected.

A transcript of a student's academic record cannot be released until all of his or her accounts, academic and nonacademic, are paid.

Any Nova Southeastern University student has the right to inspect and review his or her educational record. The policy of the university is not to disclose personally identifiable information contained in a student's educational record without prior written consent from the student, except: to university officials, to officials of another school in which the student seeks enrollment, to authorized representatives of federal or state agencies, to accrediting organizations, to parents of dependent students, under judicial order, to parties in a health or safety emergency, or when verifying graduation with a particular degree.

A student has the right to petition Nova Southeastern University to amend or correct any part of his or her educational record that he or she believes to be inaccurate, misleading, or in violation of the privacy or other rights of students. If the university decides it will not amend or correct a student's record, the student has a right to a hearing to present evidence that the record is inaccurate, misleading, or in violation of the privacy or other rights of students.

If these rights are violated, a student may file a complaint with the Department of Education. A student may obtain a copy of the Educational Privacy Act policy by requesting it in writing from the Office of the University Registrar, Nova Southeastern University, 3301 College Avenue, Fort Lauderdale, Florida 33314-7796. A schedule of fees and a listing of the types and locations of educational records are contained in this policy.

Nova Southeastern University does not discriminate on the basis of disability, sex, race, religion, or national or ethnic origin in admission, access, or employment for any of its programs and activities. The university registrar and director of human resources have been designated as student and employee coordinators, respectively, to ensure compliance with the provisions of the applicable laws and regulations relative to nondiscrimination.

The school is authorized under federal law to enroll nonimmigrant alien students.

Policies Governing Student Relations

General

Nova Southeastern University has established specific policies, procedures, and guidelines defining its relationship with its students. The term "student" as used in this catalog defines the student, or parents of the student if the student qualifies as a dependent under the provisions of the Internal Revenue Code.

Institutional and Academic Information

Nova Southeastern University and its composite academic units periodically publish bulletins or catalogs describing the university and its academic programs. These bulletins are available to enrolled and prospective students through the various admissions offices associated with the academic units or from the Office of the University Registrar. Each academic unit, group of units, and/or the Office of the University Registrar maintain at least one full-time employee to assist all students in obtaining information.

Financial Aid

Nova Southeastern University's Office of Student Financial Aid staff administers comprehensive federal, state, institutional, and private financial aid programs. The purpose of these programs is to provide monetary assistance to students who can benefit from further education but who cannot do so without such assistance. Students interested in receiving a financial aid packet should contact the Office of Student Financial Aid at (954) 262-3380 or 800-522-3243.

When to Apply for Financial Aid

It is recommended that students apply for financial aid well in advance of the date the funds will be needed because normal application processing takes six to eight weeks and sometimes as many as 12 weeks. It is extremely important that students complete all forms correctly and respond promptly to all inquiries in order to prevent delays in processing. Awards are made only for the academic year. Applications are generally available each January for the following academic year. Students requesting financial aid for the summer term must complete a separate summer aid application that is generally available after January.

To improve telephone service to financial aid applicants, NSU's Office of Student Financial Aid has a telephone voice response system. The Automated Telephone Counseling (ATC) System helps students access information regarding financial aid applications. General financial aid information may be obtained, packets may be requested, or application status can be checked (including loan disbursement information) simply by entering the student's Social Security number and four-digit PIN. The ATC is available 24 hours a day, 7 days a week, and file information is updated daily. The ATC may be accessed locally at (954) 262-3380 or toll free at 800-522-3243.

General Eligibility Requirements

In order to participate in the financial aid program, students generally must:

1. be U.S. citizens, permanent residents, or in the United States for other than a temporary purpose, and be able to provide proof of such
2. be accepted for enrollment in an eligible degree-seeking program at Nova Southeastern University
3. be making satisfactory progress in their courses of study
4. not be in default of, or owe, a refund for any financial aid received previously
5. sign a Statement of Educational Certification
6. be registered with Selective Service if required to do so by federal law

International Students

International students who intend to reside in the United States and who are required to obtain an I-20 visa must be full-time, degree-seeking students and must attend the main campus in Fort Lauderdale, Florida. For further information, contact the International Student Adviser, Nova Southeastern University, 3301 College Avenue, Fort Lauderdale, Florida 33314-7796, telephone: (954) 262-7240 or toll free 800-541-6682, ext. 7240.

Veterans' Benefits

Nova Southeastern University programs are approved for the training of veterans and other eligible persons by the Bureau of State Approval for Veterans' Training, Florida Department of Veterans' Affairs. Eligible veterans and veterans' dependents should contact the Office of the University Registrar, 3301 College Avenue, Fort Lauderdale, Florida 33314-7796, telephone (954) 262-7241 or toll free 800-541-6682, ext. 7241.

Notice of Nondiscrimination

Nova Southeastern University admits students of any race, color, sex, age, nondisqualifying disability, religion or creed, or national or ethnic origin to all the rights, privileges, programs, and activities generally accorded or made available to students at the school, and does not discriminate in administration of its educational policies, admissions policies, scholarship and loan programs, and athletic and other school-administered programs. The Office of the University Registrar is designated as the policy coordinator to ensure compliance with all federal, state, and local laws and regulations relative to nondiscrimination.

Grievances

When questions about procedures, decisions, or judgments occur, counseling is available for discussion and resolution of differences. Students may also have recourse to more formal avenues of appeal and redress. Grievance procedures are explained elsewhere in this catalog.

Student Publications

Nova Southeastern University, as publisher, bears the legal responsibility for the contents of student publications. In the delegation of editorial responsibility to students, the university provides sufficient editorial freedom for the student publications to maintain their integrity of purpose as vehicles of free inquiry and free expression in the Nova Southeastern University academic community.

The delegated editorial freedom of student editors and managers is subject to corollary responsibilities to be governed by the canons of responsible journalism, such as the avoidance of libel, indecency, undocumented allegations, attacks on personal integrity, and the techniques of harassment and innuendo.

As safeguards for the delegated editorial freedom of student publications, the following provisions are made:

1. The student press shall be free of censorship and advance approval of copy, and its editors and managers shall be free to develop their own editorial policies and news coverage.

2. Editors and managers of student publications shall be protected from arbitrary suspension and removal because of student, faculty, administrative, or public disapproval of editorial policy or content. Only for proper and stated causes shall editors and managers be subject to removal, and then by orderly and prescribed procedures.

3. All university-published and financed student publications shall explicitly state on the editorial page that the opinions therein expressed are not necessarily those of Nova Southeastern University or of the student body.

Student Participation in University Governance

In furtherance of its commitment to teaching and learning, Nova Southeastern University encourages student participation in institutional decision making. Within each center, elected student government bodies provide vehicles for student expression of views and opinions on issues of institutional policy. Officers of the student government are members of the President's Student Advisory Committee, which meets monthly with the president and appropriate senior administrative staff to discuss university matters of general interest to the student body. Additionally, students are regularly appointed to committees, task forces, and ad hoc groups dealing with issues of concern to student, including appointment to each self-study subcommittee.

Student Rights and Responsibilities

Code of Student Conduct and Academic Responsibility

Purpose: This code seeks to promote high standards of academic integrity by setting forth the responsibilities of students as members of the university community. Abiding by the code ensures a climate wherein all members of the university community can exercise their rights of membership.

Statement of Academic Rights and Responsibilities

Nova Southeastern University, as a community of women and men, is committed to furthering scholarship, academic pursuits, and service to our society. As an institution, our purpose is to ensure all students an equal opportunity to fulfill their intellectual potential through pursuit of the highest standards of academic excellence.

Certain rights and obligations flow from membership in any academic community committed to such goals:

a) the rights of personal and intellectual freedom, which are fundamental to the idea of a university

b) scrupulous respect for the equal rights and dignity of others

c) dedication to the scholarly and educational purposes of the university and participation in promoting and ensuring the academic quality and credibility of the institution

Students are responsible for obtaining, learning, and observing the established university and center policies as listed in all official publications. In addition, students must comply with the legal and ethical standards of the institution as well as those of Broward County and the state of Florida. All members of the community should inform the appropriate official of any violation of conduct regulations.

A. Academic Standards

The university expects its students to manifest a commitment to academic integrity through rigid observance of standards for academic honesty. The academic honesty standards include:

1. Original Work. Assignments such as course preparations, exams, texts, projects, term papers, practicums, etc., must be the original work of the student. Original work may include the thoughts and words of another author but, if that is the case, those ideas or words must be indicated in a manner consistent with a university-recognized form and style manual.

Work is not original that has been submitted previously by the author or by anyone else for academic credit. Work is not original that has been copied or partially copied from any other source, including another student, unless such copying is acknowledged by the person submitting the work for the credit at the time the work is being submitted or unless copying, sharing, or joint authorship is an express part of the assignment. Exams and tests are original work when no unauthorized aid is given, received, or used prior to or during the course of the examination.

2. Referencing the Works of Another Author. All academic work submitted for credit or as partial fulfillment of course requirements must adhere to each center's specific accepted reference manuals and rules of documentation. Standards of scholarship require that proper acknowledgment be given by the writer when the thoughts and words of another author are used. Students must acquire a style manual approved by their center and become familiar with accepted scholarly and editorial practice in their program. Students' work must comport with the adopted citation manual for their particular center.

At Nova Southeastern University, it is plagiarism to represent another person's work, words, or ideas as one's own without use of a center-recognized method of citation. Deviating from center standards (A) (1) or (A) (2) is considered plagiarism at Nova Southeastern University.

3. Tendering of Information. All academic work must be the original work of the student. Giving or allowing one's work to be copied, giving out exam questions or answers, or releasing or selling term papers is prohibited.

4. Acts Prohibited. Students should avoid any impropriety or the appearance thereof, in taking examinations or completing work in pursuance of their educational goals.

Violations of academic responsibility include, but are not limited to:

i) plagiarism

j) any form of cheating

k) conspiracy to commit academic dishonesty

l) misrepresentation

m) bribery in an attempt to gain an academic advantage

n) forging or altering documents or credentials

o) knowingly furnishing false information to the institution

5. Additional Matters of Ethical Concern. Where circumstances are such as to place students in positions of power over university personnel, inside or outside the institution, students should avoid any reasonable suspicion that they have used that power for personal benefit or in a capricious manner.

B. Conduct Standards

1. Students should not interfere with the rights, safety, or health of members of the university community nor interfere with other students' right to learn. Students are expected to abide by all university, center, and program rules and regulations and all local, state, and federal laws. Violations of conduct standards include, but are not limited to:

a) theft

b) vandalism

c) disruptive behavior

d) possession or use of firearms, fireworks, explosives, or other dangerous substances or items

e) possession, transfer, sale, or use of illicit drugs

f) appearance in class or on campus under the apparent influence of alcohol or illicit drugs or chemicals

g) violations of housing regulations

h) any act or conspiracy to commit an act which is harassing or abusive or which invades an individual's right to privacy, including, but not limited to, sexual harassment and abuse against members of a particular racial, ethnic, religious, or cultural group

i) threats of or actual damage to property or physical harm to others

j) failure to pay tuition and fees in a timely manner

Furthermore, Nova Southeastern University prohibits any activity that may be construed as hazing. ("Hazing" is defined as: any action or situation which recklessly or intentionally endangers the mental or physical health or safety of a student for the purpose of initiation or admission into or affiliation with any organization operating under the sanction of a university).

2. Students must have authorization from the university to have access to university documents, data, programs, and other types of information and information systems. Any use of the above without authorization is prohibited.

C. Supplementary Standards

Students are expected to comply with the legal and ethical standards of this institution and those of their chosen field of study, including the code of ethics for computer usage. The university and each center or program may prescribe additional standards for student conduct as would comport with the letter and spirit of this code.

D. Violations

Any violation(s) of any of the academic standards, conduct standards, or supplementary standards may result in a complaint being filed against a student to enforce the Code of Student Conduct and Academic Responsibility. Deans or directors may, in their discretion, immediately suspend students pending a hearing on charges of academic conduct or supplementary standard violations. Any student found guilty of a violation of the academic, conduct, or supplementary standards will be subject to disciplinary action, including expulsion from the university.

Student Code of Computer Ethics

Student users of Nova Southeastern University's computer systems are subject to all applicable federal, state, and international computer laws. A copy of the Florida Computer Crimes Act and referenced Florida State Statutes may be examined online or in a student's academic program office.

Nova Southeastern University provides computer systems with access to hardware, software, and networks to enhance academic experience. Ethical conduct by students in the use of this technology is the same as in all other areas of university life, and it is of equal importance. All students are expected to abide by the Nova Southeastern University Code of Student Conduct and Academic Responsibility.

Policy on Acceptable Use of Computing Resources

This policy provides guidelines for the appropriate and inappropriate use of the computing resources of Nova Southeastern University. It applies to all users of the university's computing resources including students, faculty, staff, alumni, and guests of the university. Computing resources include all computers, related equipment, software, data, and local area networks for which the university is responsible as well as networks throughout the world to which the university provides computer access.

The computing resources of Nova Southeastern University are intended to be used for its programs of instruction and research and to conduct the legitimate business of the university. All users must have proper authorization for the use of the university's computing resources. Users are responsible for seeing that these computing resources are used in an effective, ethical, and legal manner. Users must apply standards of normal academic and professional ethics and considerate conduct to their use of the university's computing resources. Users must be aware of the legal and moral responsibility for ethical conduct in the use of computing resources. Users have a responsibility not to abuse the network and resources, and to respect the privacy, copyrights, and intellectual property rights of others.

In addition to the policy contained herein, usage must be in accordance with applicable university policies (see "Related Policies" listed elsewhere in this policy) and applicable State and Federal laws. Among the more important laws are the Florida Computer Crimes Act, the Federal Computer Abuse Amendment Act 1994, the Federal Electronic Communications Privacy Act, and the U.S. Copyright Act. Copies of these laws and the NSU Copyright Policy may be examined in the Office of Academic Affairs.

Policy violations generally fall into five categories that involve the use of computing resources:

1. for purposes other than the university's programs of instruction and research and the legitimate business of the university

2. to harass, threaten or otherwise cause harm to specific individuals or classes of individuals

3. to impede, interfere with, impair, or otherwise cause harm to the activities of others

4. to download, post or install to university computers, or transport across university networks, material that is illegal, proprietary, in violation of license agreements, in violation of copyrights, in violation of university contracts, or otherwise damaging to the institution

5. to recklessly or maliciously interfere with or damage computer or network resources or computer data, files, or other information

Examples (not a comprehensive list) of policy violations related to the above five categories include:

- using computer resources for personal reasons
- sending E-mail on matters not concerning the legitimate business of the university
- sending an individual or group repeated and unwanted (harassing) E-mail or using E-mail to threaten someone
- accessing, or attempting to access, another individual's data or information without proper authorization (e.g. using another's computing account and password to look at their personal information)
- propagating electronic chain mail, pyramid schemes or sending forged or falsified E-mail
- obtaining, possessing, using, or attempting to use someone else's password regardless of how the password was obtained
- copying a graphical image from a Web site without permission
- posting a university site-licensed program to a public bulletin board
- using illegally obtained licensed data/software, or using licensed data/software in violation of their licenses or purchase agreements
- releasing a virus, worm or other program that damages or otherwise harms a system or network
- preventing others from accessing services
- attempting to tamper with or obstruct the operation of NSU's computer systems or networks
- using or attempting to use NSU's computer systems or networks as a means for the unauthorized access to computer systems or networks outside the university
- distributing, downloading, posting, or transporting child pornography via the web
- using university resources for unauthorized purposes (e.g. using personal computers connected to the campus network to set up web servers for illegal, commercial, or profit-making purposes)
- violating Federal copyright laws or the NSU copyright policy

Inappropriate conduct and violations of this policy will be addressed by the appropriate procedures and agents (e.g., the Office of the Dean, the Office of the Vice President for Academic Affairs, or the Office of Human Resources) depending on the individual's affiliation to the university.

Policy on the Use of Material in Web Pages

You should assume that materials you find on the Web are copyrighted unless a disclaimer or waiver is expressly stated. You may not place any materials owned by others, i.e. copyrighted works, on your Web page(s) without the expressed permission of the copyright owner. (Examples: graphic images from other Web pages, articles, video, audio, photographs, software, or images scanned from published works). You may include short quotations of text provided you identify in an obvious way (e.g., in a footnote) the author and the work from which the quotation is taken. If you want to include something from another Web page in one of your Web pages, then link to it rather than copy it. The occurrence of plagiarism on your Web page is subject to the same sanctions as apply to plagiarism in any other media. Images in the NSU Graphics repository may be used on Web pages without permission. Clip art images provided with licensed software may be used if permitted in the license agreement for such software. You may not place any pictures or videos of people on a Web page without the expressed permission of the people in the picture or video. Every person has a right to privacy which includes the right to restrict the use of his/her own image. In addition, the picture or video may be protected by copyright.

If you have received formal permission to use material owned by another, place the following notice on the page that contains the copied material:

Copyright 1997 by <name of the copyright owner>. Used with permission.

Although a copyright notice is not required to assert your rights to your own original material, you may want to include a minimal notice of copyright in a Web page footer when appropriate. When used, the copyright notice should appear as follows: (The symbol © may be used in lieu of "Copyright" or immediately after it.)

Individual Web pages:
Copyright 1999 <your name>. All rights reserved.

Organization Web pages (examples):
Copyright 1996 Cornell Law Review. All Rights Reserved.
Copyright 1999 Nova Southeastern University. All Rights Reserved.
Copyright 1998 The School of Computer and Information Sciences. All Rights Reserved.

Related NSU policies that also apply to the student code of computer ethics:

1. General policies:
   Copyright and Patent Policy
   Computing Account Security Agreement

2. Student-related: Student Code of Student Conduct and Academic Responsibility

3. Faculty/administrator-related: Faculty/Academic Administrator Policy Manual

4. Staff-related: Employee Handbook

Drug-Free/Smoke-Free Schools and Campuses

General

In order to comply with the Drug-Free Schools and Communities Act (Pub. L. No. 101-226, Title 34 C.F.R., part 86), Nova Southeastern University has adopted the following policy for all workplace, school, campus, and field-based programs.

The unlawful manufacture, distribution, dispensation, possession, or use of illicit drugs and the abuse of alcohol are prohibited in and on Nova Southeastern University-owned or controlled property and as a part of any of its activities. (The term "illicit drugs" refers to all illegal drugs and to legal drugs obtained or used without physician's order.) No Nova Southeastern University employee or student is to report to work or school while under the influence of illicit drugs or alcohol.

There are serious health risks associated with the abuse of drugs and alcohol. If you, a fellow student, teacher, or coworker has a problem with abuse of drugs and/or alcohol, help can be provided at the following locations:

On Campus:

Nova Southeastern University Student Counseling Service
Mailman Building
(954) 262-7040

Nova Southeastern University Community Mental Health
Davie (954) 262-7040
Lauderdale Lakes (954) 486-3663
Coral Springs (954) 753-7020

Community:

Florida Department of Education
Educational Prevention Center
Knott Building
Tallahassee, Florida 32399
(904) 488-6304

Department of Health and Rehabilitative Services
Alcohol and Drug Abuse Program
1317 Winewood Boulevard
Tallahassee, Florida 32399
(904) 488-0900

When you use or deal in drugs, you also risk incarceration and/or fines. The attached federal sentencing guidelines indicate federal penalties for trafficking in drugs.

In addition to the federal sanctions, Florida statutes provide sanctions in regard to the use, possession, and/or sale of illicit drugs and the abuse of alcohol. Punishment varies depending upon the amount and type of drugs and/or alcohol involved. Felony convictions range from one year to life imprisonment. Possession of not less than 20 grams of cannabis is punishable as a misdemeanor of the first degree. Punishment for misdemeanors ranges from less than 60 days to one year of imprisonment. Under §893.13, Florida Statutes, it is unlawful for any person to sell, purchase, manufacture, deliver, or possess with intent to sell, purchase, manufacture, or deliver a controlled substance. Violation of this statute is a felony and is punishable under Chapter 775 of the Florida Statutes.

Under §893.13 (1) (e), Florida Statutes, it is unlawful for any person to sell, purchase, manufacture, deliver, or possess with the intent to sell, purchase, manufacture, or deliver controlled substance in, on, or within 1,000 feet of a public or private elementary, middle, or secondary school. Punishment for a violation of this statute may include a minimum three-year imprisonment.

Under §316.1936, Florida Statutes, it is unlawful for any person to possess an open container of an alcoholic beverage while operating a vehicle in the state or while a passenger in or on a vehicle being operated in the state. Violation of this law will result in a non-criminal moving traffic violation, punishable as provided in Chapter 318 of the Florida Statutes, with fines and points on a driving record leading to driver's license suspension.

Under §316.193, Florida Statutes, a person is guilty of driving under the influence if such a person is driving or in actual physical control of a vehicle within the state and the person is under the influence of alcoholic beverages or any controlled substance when affected to the extent that his or her normal faculties are impaired or the person has a blood alcohol level of .10 percent or higher. First conviction on such a DUI charge shall result in a fine not less than $250 or more than $500 and imprisonment for not more than six months. A second conviction results in a fine of not less than $500 or more than $1,000 and not more than nine months' imprisonment. A third conviction will result in not less than a $1,000 fine or more than a $2,500 fine and imprisonment for not more than 12 months.

By applying for a driver's license and accepting and using a driver's license, a person holding the driver's license is deemed to have expressed his or her consent to submit to breath, blood, and urine tests for alcohol, chemical substances, or controlled substances.

Nova Southeastern University requires that an employee notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after such conviction. In order to comply with federal law, Nova Southeastern University must notify any federal contracting agency within ten days of having received notice that an employee engaged in the performance of a federal contract or grant has had a criminal drug statute conviction for a violation occurring in the workplace. Any criminal drug convictions in the workplace must be reported by the employee to his or her university supervisor or department head within five days of the date of such conviction. The university will discipline any employee who is so convicted, or require the employee's satisfactory participation in a drug/alcohol abuse assistance or rehabilitation program within thirty days of notice of such conviction.

Any Nova Southeastern University employee or student determined to have violated this policy shall be subject to referral for prosecution by the appropriate authorities. Other sanctions include evaluation/treatment for drug-use disorder, which may include mandatory completion of a drug/alcohol abuse rehabilitation program, expulsion, and/or termination.

All Nova Southeastern University faculty and staff members will, as a condition of their employment, abide by the terms of this policy. All Nova Southeastern University students will, as a condition of their enrollment, abide by the terms of this policy.

Alcohol and Other Drugs

Nova Southeastern University, as an institution of higher education, is dedicated to the well-being of all members of the university community—students, faculty, staff, and administrators. Concerned with the misuse of alcohol and other drugs (both licit and illicit), the university endeavors to prevent substance abuse through programs of education and prevention.

The university recognizes alcoholism and drug abuse as illnesses or treatable disorders, and it is the university's policy to work with members of the university community to provide channels of education and assistance. However, it is the individual's responsibility to seek help. The university also recognizes that the possession and/or use of certain substances is illegal, and the university is obligated to comply with local, state, and federal laws.

While on campus or engaged in any university-related activity, members of the university community must be in a fit condition to perform appropriately. Being under the influence of alcohol and/or drugs is prohibited and may subject the individual to disciplinary action, including the possibility of dismissal.

Employees will be evaluated only on their work performance. If alcohol consumption or the use of any other drug affects an employee's performance, assistance is available. However, if an employee's performance continues to deteriorate, the university will discipline the employee based on his or her job performance. Poor job performance will lead to discharge.

Professional assistance for substance abuse is given on a confidential, professional, and voluntary basis. The purpose of this assistance is to help the individual member of the university community who has a substance abuse problem lead a productive and/or academic life free of substance abuse.

Members of the university community who engage in any illegal activity involving alcohol or other drugs are subject to dismissal.

Substance Abuse Awareness, Education, and Prevention

Nova Southeastern University's activities in substance abuse awareness, education, and prevention exist to encourage members of the university community to avoid the use of illicit drugs, to use alcohol and other licit drugs in a responsible manner, and to avert the need for direct intervention. The specific goals of the program are:

- to educate all members of the community that the use and possession of certain substances are illegal and may result in adverse consequences
- to inform members of the university community concerning the physical and psychological effects of alcohol and other drugs and to develop an awareness of potential problems that can result from the use of these substances
- to support those who choose not to drink alcohol or to use other drugs
- to teach those who choose to drink alcohol to do so responsibly
- to help those who abuse alcohol or other drugs

In order to achieve these goals, the university operates and/or engages in the following programs and activities:

Alcohol and Drug Resource Center. The Resource Center is directed by an existing staff member. Additional staff consists of student employees, practicum students, and/or student volunteers. The center has the primary responsibility for the university's prevention and education programs. It coordinates the various activities and serves as a clearinghouse for alcohol and drug information. Each academic center designates a contact person who works with the center's staff to disseminate information within their centers.

Advisory Committee. This is a group of administrators, faculty, and student leaders appointed by the vice president for academic affairs to serve as advisers and resource persons. The committee is chaired by the director of the Alcohol and Drug Resource Center. The group meets monthly to discuss and develop program plans and activities.

Alcohol and drug awareness activities. Under the direction of the Resource Center, there are regular and ongoing activities designed to disseminate information about alcohol and drug use. The target audience includes all students, employees, and faculty members of the university, both on and off campus. The awareness activities can include posters, media campaigns, films, exhibits, and literature. The university supports National Alcohol Awareness Week and schedules activities at that time to promote awareness on campus.

Student organizations. The student governments are encouraged to establish chapters of organizations such as BACCHUS (Boost Alcohol Consciousness Concerning the Health of University Students) and SADD (Students Against Drunk Driving).

Alcohol and drug workshops. Workshops are provided for student leaders and for employees as part of the university's staff-development program. These workshops provide the opportunity for participants to discuss the information they receive. Student leaders are required to complete such workshops before they can plan parties that involve drinking.

Academic courses. Several academic centers have put identifiable units on alcohol and drugs into appropriate existing courses. Additionally, several academic centers have established elective courses in substance abuse and/or recommend students to take such courses in other centers. Assistance is available to the academic centers from the Alcohol and Drug Abuse Resource Center to ensure that the substance abuse content of courses is consistent with university policies.

Orientation. Academic centers include information on drugs and alcohol in the orientation sessions and materials for new students. The orientation provides a general introduction to the problems of substance abuse and includes a statement of the university's policy on drugs and alcohol. The information is presented in a positive manner. The Resource Center works with the academic centers to prepare the materials presented.

Smoking

Smoking is prohibited in any Nova Southeastern University facility where, regardless of physical separation, nonsmokers share a ventilation system with smokers. This policy does not apply to living quarters (dormitories) which are subject to a separate smoking policy. Nor does this policy in any way supersede the Florida Clean Indoor Air Act.

Communicable Diseases Policy

It is the intent of the university to protect students and employees from exposure to communicable diseases that pose reasonable risk of harm to members of the university community. It is also the intent of the university to protect the rights of those infected with a communicable disease pursuant to the Sick Leave Policy of the university. Employees and students of the university who do become infected with a communicable disease are subject to the guidelines listed below. All employees diagnosed with any communicable disease will receive the same benefits and privileges extended to any employee under the Sick Leave Policy and shall be afforded confidentiality for all related issues. The university will be flexible in its response to incidents of communicable disease, evaluating each occurrence in light of this policy and current available medical information.

Policy Guidelines

1. For the purpose of this policy, the term "employee" shall include all persons employed by the university, either full time or part time, including adjuncts and off-site coordinators, but shall not include members of the board of trustees, guest lecturers, and vendors. The term "student" shall include all persons enrolled at the university, either part time or full time, from preschool through graduate studies. The term "infected person" shall include students and employees who have been medically diagnosed as infected with a communicable disease.

2. In the event that any employee, administrator, or student has a concern about the potential for the spread of a communicable disease within the university community, those concerns should be brought to the assistant director of human resources for review consistent with the current available information on the spread of the particular communicable disease. After review and evaluation of the concerns, if there appears to be a reasonable likelihood of the spread of the disease within the university community by an infected person, the assistant director of human resources will, after notification of the issues presented to the university president, contact the Broward County Health Department for recommendations of appropriate action consistent with state law.

3. The university will make available to its employees and students information about the transmissibility of communicable diseases and precautions that can be taken to prevent the spread of various communicable diseases.

4. An infected person can continue to work and study as long as he or she is able to continue to perform regular responsibilities satisfactorily, and as long as the best available medical evidence indicates that his or her continued status does not present a health or safety threat to self or others. Infected employees with diseases that threaten the safety of others are eligible for the same leave of absence provisions of current university policy for sick or annual leave as other employees.

5. An infected person returning to work or school after a leave of absence for reasons related to a communicable disease must provide a statement from his or her treating physician indicating current medical status. An employee shall submit the physician's statement to the director of human resources or a delegated representative. Students shall submit their statement to their program dean.

6. Within reason, the university shall make accommodations for the infected persons, whenever possible, to ensure continuity in employment or in the classroom. Such measures may include, subject to administrative limitations, job reassignment or class reassignment to place the infected person in a less demanding position.

7. No infected person (employee or student) may be dismissed from the university solely on the basis of a diagnosis of an infection of a contagious disease. A decision to dismiss or discharge will only be made after reasonable accommodation has been attempted and an examination of facts demonstrate that the infected person can no longer perform as required or poses a reasonable threat to the health and safety of those around him or her.

8 Disciplinary measures are available to the university when any employee fails or refuses to work at his or her assigned job with an infected person who has not been deemed to pose a present health or safety threat to self or others. Student disciplinary measures shall range from counseling to expulsion.

9. As with any medical condition, employees must not disclose information regarding another employee or student to anyone except those employees with a medical or administrative need to know. The university shall take every precaution to ensure that confidentiality is maintained. Breach of such confidentiality by any employee shall result in disciplinary action.

Policy on Sexual Harassment

It is the intent of Nova Southeastern University to protect all employees and students from sexual harassment. Sexual harassment is a violation of Title VII. Sexual harassment undermines the integrity of the employment and academic environment, debilitates morale, and interferes with the effectiveness of employees and students. In accordance with Equal Employment Opportunity Commission–promulgated guidelines, unwelcome sexual advances, unwanted requests for favors of a sexual nature, and any other verbal or physical conduct of a sexual nature are considered sexual harassment if:

(a) explicit or implicit submission to sexual overtures is made a term or condition of employment.

(b) employment decisions are made on the basis of whether submission to or rejection of sexual overtones occurred.

(c) an individual's work performance is unreasonably interfered with by a sexually intimidating, hostile, or offensive atmosphere.

A. At Nova Southeastern University, sexual harassment of or by employees includes:

1. Unwelcome or unwanted sexual advances. This includes unwelcome physical contact or sexual advances considered unacceptable by another individual.

2. Requests or demands for sexual favors. This includes subtle or blatant pressures or requests for any type of sexual favor accompanied by an implied or stated promise of preferential treatment or negative consequence concerning one's employment status.

3. Verbal abuse that is sex-oriented or considered unacceptable by another individual, as well as sexually derogatory comments. This includes commenting about an individual's body or appearance when such comments go beyond mere courtesy; telling jokes that are clearly unwanted and considered offensive by others; or other tasteless, sexually oriented comments or innuendoes or actions that offend others.

4. Engaging in any type of sexually oriented conduct that would unreasonably interfere with another's work performance. This includes extending unwanted sexual attention to someone that reduces personal productivity or time available to work at assigned tasks.

5. Creating a work environment that is intimidating, hostile, or offensive because of unwelcome or unwanted sexually oriented conversations, suggestions, requests, demands, physical contacts, or attentions.

Nova Southeastern University will not tolerate sexual harassment. Sexual harassment is an insidious practice. It demeans individuals being treated in such a manner and creates unacceptable stress for the entire organization. Persons harassing others will be dealt with swiftly and vigorously.

Normal, noncoercive interaction that is acceptable to both parties is not considered to be sexual harassment.

All allegations of sexual harassment of or by an employee, client, or vendor will be promptly and thoroughly investigated by the Human Resources Department and should be reported promptly to the director of human resources.

B. At Nova Southeastern University, sexual harassment of students by employees is defined as unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature when:

1. submission to such conduct is made to appear to be a term or condition of enrollment, attendance, or participation in a class

2. submission to or rejection of such conduct affects academic decisions

3. such conduct has the purpose or effect of unreasonably interfering with a student's academic performance or creating an intimidating, hostile, or offensive academic environment

and can include:

4. unwelcome patting, pinching, or touching
5. offensive or demeaning sexual remarks, jokes, or gestures

Students aggrieved by a violation of this policy may file a grievance under their center's grievance procedure.

Any employee who violates any portion of this policy shall be subject to disciplinary action.

At Nova Southeastern University, romantic and sexual relationships between a faculty member and a student are subject to the prohibition against sexual harassment.

Romantic or sexual relationships between a faculty member and a student then enrolled in the faculty member's class (including supervised student activities for which academic credit is given) may appear to be coercive and are discouraged. Even when no coercion is present, such relationships create an appearance of impropriety and favoritism that can impair the academic experience of all students in that class. It is, therefore, improper conduct for a faculty member to engage in a romantic or sexual relationship with a student then enrolled in the faculty member's class.

Privacy of Records

Nova Southeastern University maintains a system of records that includes application forms, admission test scores, and transcripts of students' previous academic records and performance while in residence. These records are available for review by present and former students upon written request to the Office of the University Registrar. However, the registrar will not release transcripts of students' academic records until all accounts, both academic and nonacademic, have been paid.

The law limits access by and disclosure to a third party. Such access is given only upon consent of the student or if required by law, except for the following information, which may be released as directory information: (a) student's name, (b) address, (c) dates of attendance, (d) degree and awards received. Requests for such information must be submitted in writing to the university. The university reserves the right to refuse the above information if the reason for the request is not considered to be a sufficient need to know.

Any student or parent not wishing to have this information disclosed should notify the Office of the University Registrar in writing prior to September 1 of the relevant school year.

A person does not have the right of access to educational records until he or she has been admitted to and has actually begun attending Nova Southeastern University. There is no prohibition from disclosing such information to the parents of students who are listed on their parents' federal income tax forms.

Parents or eligible students will be provided a hearing by the university if they wish to challenge the content of the record. If they are still not satisfied, the parents or eligible students may add explanatory or rebuttal matter to the record. If the students or parents are denied access to a hearing or if the records are alleged to have been illegally disclosed to a third party, the students or parents may file a complaint with the U.S. Department of Education.

Reservation of Power

Nova Southeastern University reserves the right to amend, modify, add to, or delete its rules, policies, and procedures affecting its institutional relationship with students as deemed necessary by the administration. Any such amendment, modification, addition, or deletion shall not be considered a violation of the relationship between the university and the student. Such right includes modification to academic requirements, curriculum, tuition, and/or fees when in the judgment of the administration such changes are required in the exercise of its educational responsibility.

Index

NOVA SOUTHEASTERN UNIVERSITY

SCHOOL OF COMPUTER AND INFORMATION SCIENCES
3100 SW 9th Avenue
Fort Lauderdale, Florida 33315